PB92-166883

Beyond the Border: Environmental Management in Washington and British Columbia

(U.S.) Environmental Protection Agency, Seattle, WA

1 Jan 92

U.S. Department of Commerce
National Technical Information Service
NTIS

PB92-166883

EPA 910/9-91-038

Puget Sound Estuary Program

Beyond the Border: Environmental Management in Washington and British Columbia

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U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA 22161

BEYOND THE BORDER

Environmental Management in British Columbia and Washington

By
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Prepared for

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1200 Sixth Avenue
Seattle, WA 98101

January 1, 1992

EPA 910/9-91-038

50272-101

REPORT DOCUMENTATION PAGE

1. REPORT NO. EPA 910/9-91-038

2.

3. PB92-166883

4. Title and Subtitle
Beyond the Border: Environmental Management in Washington and British Columbia

5. Report Date January 1,1992

6.

7. Author(s)
Chrisine Nasser

8. Performing Organizatio . Rept. No

9. Performing Organization Name and Address

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address

U.S. Environmental Protection Agency
Region 10, Office of Coastal Waters
1200 Sixth Avenue
Seattle, WA 98101

13. Type of Report & Period Covered

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

This report provides an introduction to U.S. and Canadian systems of government as well as an overview of the major environmental agencies and laws in Washington and British Columbia. It summarizes the regulations and policies regarding different aspects of water quality and resource management, and highlights differences and similarities between the programs implemented. Final sections of the report feature existing transboundary cooperative agreements and recommend other areas in which additional cooperative efforts would benefit environmental management in both nations.

This report provides comprehensive overviews of numerous environmental topics (i.e., point source discharges, dredging, wetlands protection and environmental monitoring, to name a few) and provides the names of contacts in both countries for those readers who may need additional information of specific topics.
Beyond the Border seeks to provide the reader with the appropriate background to investigate, understand and work toward solving regional environmental problems.

17. Document Analysis a. Descriptors

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement

19. Security Class (This Report)

20. Security Class (This Page)

21. No. of Pages

22. Price

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ACKNOWLEDGEMENTS

This report was prepared as part of a summer graduate internship with the Environmental Protection Agency, Region 10, Office of Coastal Waters, under the supervision of Dr. John Armstrong. Review comments provided by numerous individuals in federal, state, and provincial agencies are gratefully acknowledged. While many who assisted in this project are listed as contacts throughout the document, the author greatly appreciates the additional assistance and support of Earle Anthony (Environment Canada), Robert Burd (EPA Region 10), Andrea Copping (formerly of Puget Sound Water Quality Authority), Fred Felleman (American Oceans Campaign), Jack Gakstatter (EPA Region 10), Carol Jolly (WA Department of Ecology), Linda Maxson (U.S. National Oceanic and Atmospheric Administration), Bruce Morgan (BC Environment, Lands and Parks), Tim Ransom (Puget Sound Water Quality Authority), William Sinclair (Environment Canada), and Steve Samis (Fisheries and Oceans Canada).

EXECUTIVE SUMMARY

Recent international issues such as Victoria's sewage treatment practices, the effects of British Columbia industries on the environmental quality of the Columbia River and Lake Roosevelt, the impacts in British Columbia of Nooksack River flooding, and cross-border flows of air pollutants, have raised transboundary environmental concerns to the forefront of public debate in the Pacific Northwest.

Citizens and regulators on both sides of the border have begun working together to develop effective solutions to these and other international environmental issues. For their efforts to be successful, a common understanding must exist concerning the approaches to environmental governance in Washington and British Columbia. Meetings between state, provincial and federal officials during the past year have revealed that the awareness of political, administrative and regulatory structures and processes of both neighbors needs to be improved.

This report, Beyond the Border, provides an introduction to U.S. and Canadian systems of government as well as an overview of the major environmental agencies and laws in Washington and British Columbia. It summarizes the regulations and policies regarding different aspects of water quality and resource management, and highlights differences and similarities between the programs implemented. Final sections of the report feature existing transboundary cooperative agreements and recommend other areas in which additional cooperative efforts would benefit environmental management in both nations.

Beyond the Border, was written for the U.S. Environmental Protection Agency Region 10, Office of Coastal Waters. The contents of this report primarily address surface water quality, although other important transboundary issues such as air pollution, hazardous waste transportation, ground water contamination, and shared biological resources also exist. Beyond general discussion of governments, specific topics discussed in the report include:

- Point Source Pollution Control
    - Pulp and Paper Effluent
    - Mining and Smelting Effluent
    - Municipal Sewage Effluent
- Nonpoint Source Pollution Control
- Pleasure Craft Discharges
- Oil Spill Response
- Dredging Regulations
- Ocean Dumping/ Dredged Materials Disposal
- Wetlands Protection
- Estuary Management Programs
- Marine Protected Areas
- Environmental Monitoring
- Environmental Review Processes

This report provides comprehensive overviews of these topics, and provides the names of contacts in both countries for those readers who may need additional information on specific topics. Beyond the Border seeks to provide the reader with the appropriate background to investigate, understand, and work toward solving regional environmental problems. As governments and citizens become increasingly aware of the international nature of many environmental issues, it will become more important for individuals to look beyond their borders to resolve these concerns. This report should help us all move forward in that direction.

PART I. INTRODUCTION

Canada and the United States share one of the largest undefended borders in the world. Millions of Americans and Canadians cross the international boundary each year to vacation, visit friends, or conduct business. Free trade agreements between the two nations seek to ensure continued exchanges of commercial activity and investment, and help provide similar goods and services to consumers of both countries. A shared language, democratic governments, and previous colonial ties with Europe also contribute to a sense of commonality. Despite these apparent similarities, however, the two nations are governed by different political systems and political ideologies -- differences that go beyond the color of paper money or the design of national flags. The political distinctions between the two nations sometimes startle citizens and government officials on both sides of the border, who may know little about how policies, laws or regulations are developed in the other nation.

In the Pacific Northwest, the shared natural environment is a matter of concern and interest to citizens groups and government officials. In 1988 an oil slick from a barge off the coast of southern Washington reached the shores of Vancouver Island, B.C. The incident effectively illustrated that pollution does not recognize the international boundary, and sparked a commitment to cooperative management and prevention of oil spills among authorities in Washington and British Columbia (the resulting agreement was later signed by the other states along the Pacific Coast). This cooperative venture was similar in spirit to existing international agreements between the U.S. and Canada in the Pacific Northwest, such as the Columbia River Treaty, the Pacific Salmon Treaty, and the U.S. and Canadian Coast Guards' traffic control system for shipping in the Strait of Juan de Fuca, Puget Sound, and the Strait of Georgia.

Despite the existence of these cooperative agreements, international environmental pollution remains an issue of concern in the Northwest, especially as it pertains to water quality. The 1991 Puget Sound Water Quality Management Plan addresses water quality issues in Washington's inland marine waters, and notes that the same issues relevant to Puget Sound are also significant to British Columbia's inland coastal waters. The Plan recognizes that Washington and British Columbia ultimately share these inland marine waters (Figure 1), and that each must manage the shared resources, both living and nonliving, in a responsible manner. Specific marine water quality concerns on both sides of the border include industrial and municipal discharges; nonpoint source pollution; hazardous materials transportation; oil spill prevention and response; the contribution of the region's major rivers to pollution in the Strait of Georgia and Puget Sound; and contaminated sediments and dredging. While the Puget Sound Plan emphasizes shared marine waters, other areas along the international border recognize common groundwater supplies and transboundary river systems as well as associated pollution problems.

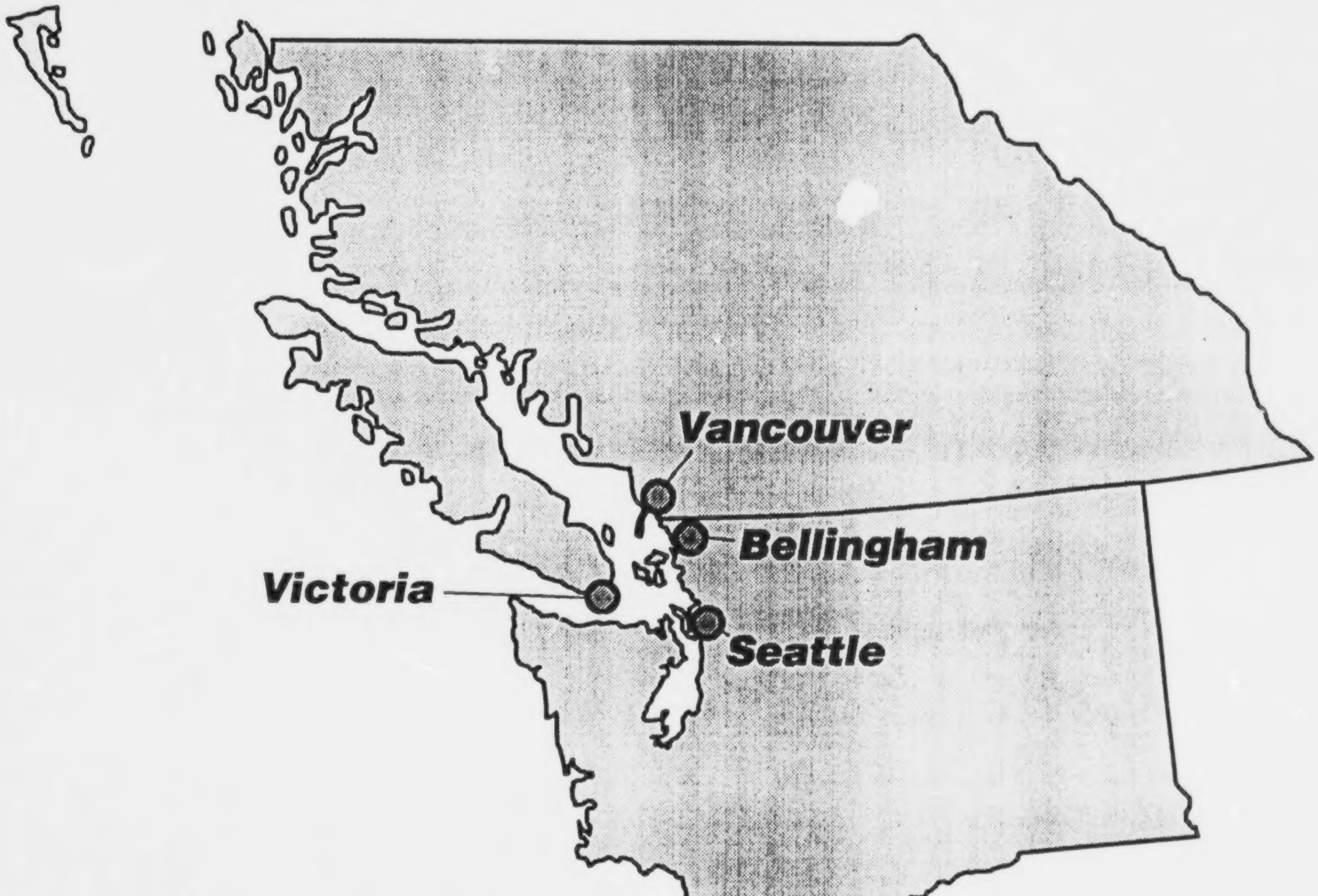

Vancouver
Bellingham
Victoria
Seattle

Figure 1:
Washington State and Southern British Columbia

Recent concerns regarding international issues such as Victoria's sewage treatment practices, the effects of British Columbia industries on the environmental quality of the Columbia River and Lake Roosevelt, the impacts in British Columbia of Nooksack River flooding, and cross-border flows of air pollutants, have raised transboundary environmental concerns to the forefront of public debate in the region. Citizens and regulators on both sides of the border have begun working together to develop effective solutions to these and other environmental issues. For their efforts to be successful, a common understanding must exist concerning the approaches to environmental governance in Washington and British Columbia. Meetings between state, provincial and federal officials during the past year have already revealed that the understanding of political, administrative and regulatory structures and processes of both neighbors needs to be improved.

To help inform government regulators as well as citizen groups and other interested parties in both Washington and British Columbia, Beyond the Border was written for the U.S. Environmental Protection Agency, Region 10. It serves as a first source of information for those concerned with how the environment is managed on either side of the border, and lays the foundation for understanding the differences and similarities between the two regulatory systems. The report provides an introduction to U.S. and Canadian government as well as an overview of the major environmental agencies and laws in Washington and British Columbia. It summarizes the regulations and policies regarding different aspects of water quality and resource management, and highlights differences and similarities between the programs implemented. Final sections of the report feature existing transboundary cooperative agreements and recommend other areas in which cooperation would benefit environmental management in both nations.

Readers interested in specific issues are encouraged to refer directly to applicable sections of the report-- some may choose to skip over those topics with which they are already familiar. While most of this report is relevant to current transboundary issues in Washington and British Columbia, many of the broader aspects of Beyond the Border (such as government structure and federal regulations) may also be useful to environmental officials concerned with Alaska and the Yukon and Northwest Territories.

Beyond the Border focuses primarily on topics pertaining to surface water quality, although other important transboundary issues such as air pollution, hazardous waste transportation, and ground water contamination also exist. In this report it was not possible to cover all issues relevant to water quality, and the exclusion of some topics should not be considered a sign of their relative importance or unimportance. This report provides a comprehensive overview of the major issues discussed, and provides the names of contacts for those readers who may need additional information. Beyond the Border does not attempt to analyze or rigorously compare the environmental policies of British Columbia and Washington, but seeks to provide the reader with the appropriate background to investigate, understand, and work toward solving regional environmental problems.

PART II. INTRODUCTION TO CANADIAN GOVERNMENT

The Dominion of Canada was established in 1867 by the British North America Act, as a loose confederation of Nova Scotia, New Brunswick, and southern Ontario and Quebec. This confederation combined three British colonies into one, and provided a mechanism for other British territories in North America to be absorbed into the new Canadian colony (Gibbins 1988). A major stimulus to this union was the emergence of a more powerful United States after the Civil War, which some believed provided a threat of annexation to the British colonies. In 1871, the people of British Columbia joined the confederation, with promises of a federal railway connecting them to the east. By 1949, when Newfoundland joined the nation, Canada encompassed the ten provinces and two territories that it does today.

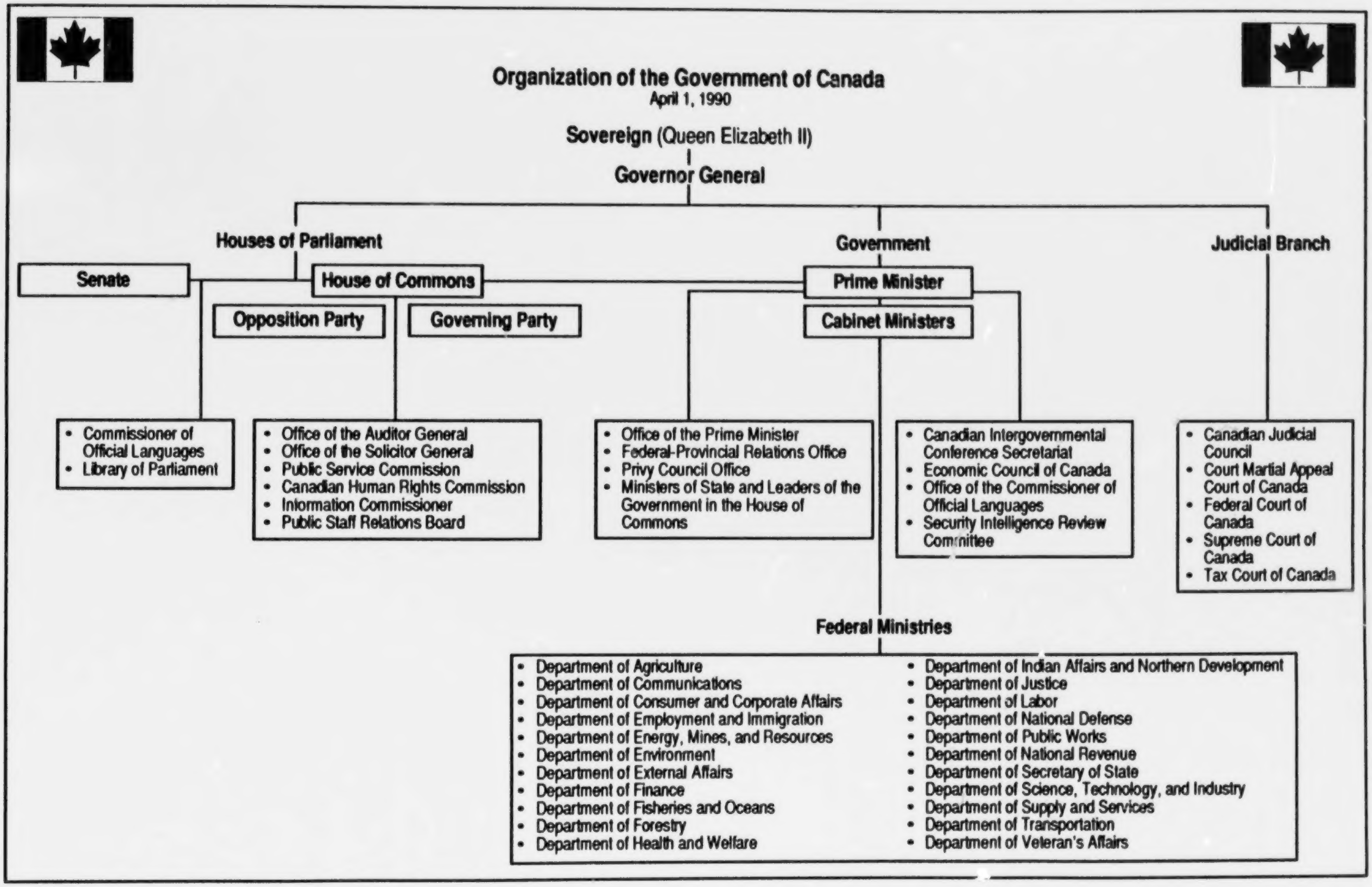
Although political independence from Great Britain was established in 1931, the monarchy of England still plays a symbolic role as sovereign. In 1982, Canada's constitutional reform culminated in the signing of the Constitution Act, which established the Charter of Rights and Freedoms, redefined the functions and powers of the federal and provincial governments, contained the Meech Lake Accord (which sought to recognize Quebec as a distinct society), and established that amendments to the constitution did not require approval by the British Parliament (as they had previously). With the Constitution Act of 1982, Canada achieved final political independence from Great Britain, although still sharing the symbol of the monarchy.

The Canadian Constitution defines a federal system of government, in which the authority to make laws is divided between the Parliament of Canada (the federal government) and the Provincial legislatures (similar to the State legislatures in the U.S.). The Constitution defines the jurisdictions of the provinces and federal government, and declares that all powers not specifically mentioned are vested in the national or federal government. Jurisdictional divisions between the provinces and federal government will be discussed in more detail in subsequent sections of this report.

Due to its historically close affiliation with Great Britain, Canada has retained a parliamentary form of government (Figure 2). The Canadian Parliament consists of the Sovereign of Canada, the House of Commons, and the Senate. The Prime Minister is the leader of the majority party in the House of Commons, nominated by the members of the party. From the elected members of the majority party, the Prime Minister chooses a Cabinet, those ministers who will head specific government departments or commissions. The Prime Minister and Cabinet essentially lead the nation's government and set the country's legislative agenda.

When one speaks of "the government" in Canada or British Columbia, the term commonly refers to the Prime Minister and Cabinet or the provincial Premier and Cabinet. Canada's independent judicial system is shared between the federal and provincial levels of government.

Figure 2.
Canadian Federal Government


Organization of the Government of Canada
April 1, 1990
Sovereign (Queen Elizabeth II)
Governor General
Houses of Parliament
Government
Judicial Branch
Senate
House of Commons
Prime Minister
Opposition Party
Governing Party
Cabinet Ministers
Commissioner of Official Languages
Library of Parliament
Office of the Auditor General
Office of the Solicitor General
Public Service Commission
Canadian Human Rights Commission
Information Commissioner
Public Staff Relations Board
Office of the Prime Minister
Federal-Provincial Relations Office
Privy Council Office
Ministers of State and Leaders of the Government in the House of Commons
Canadian Intergovernmental Conference Secretariat
Economic Council of Canada
Office of the Commissioner of Official Languages
Security Intelligence Review Committee
Canadian Judicial Council
Court Martial Appeal Court of Canada
Federal Court of Canada
Supreme Court of Canada
Tax Court of Canada
Federal Ministries
Department of Agriculture
Department of Communications
Department of Consumer and Corporate Affairs
Department of Employment and Immigration
Department of Energy, Mines, and Resources
Department of Environment
Department of External Affairs
Department of Finance
Department of Fisheries and Oceans
Department of Forestry
Department of Health and Welfare
Department of Indian Affairs and Northern Development
Department of Justice
Department of Labor
Department of National Defense
Department of Public Works
Department of National Revenue
Department of Secretary of State
Department of Science, Technology, and Industry
Department of Supply and Services
Department of Transportation
Department of Veteran's Affairs

Adapted from Chart by Treasury Board Secretariat, Ottawa, Ontario.
and World-Wide Government Directory with International Organizations, 1990

The Canadian political system is multi-party, and promotes government stability through strong party ties and no limits on reelection. During the leadership of Prime Minister Pierre Trudeau, the United States was governed by the administrations of Johnson, Nixon, Ford, Carter, and Reagan. Members of the House of Commons are popularly elected, but Senators are appointed by the Prime Minister.

The following sections of Part II will describe in more detail how the Parliament, the Government, the parties, and provincial governments function in Canada.

A. PARLIAMENT

The House of Commons:

Within the House of Commons, 295 seats are apportioned according to geographical units (provinces) based mainly upon population. Members of Parliament (MP's) are directly elected on the principle of representation by population. As in the United States, Canadians elect a single member of the House per electoral district in one round of balloting. Elections take place at least every five years, with the entire House of Commons up for election at the same time.

The House of Commons has the ability to pass legislation and participate in constitutional amendments. Its authority to ask for a vote of no-confidence allows the House of Commons to keep a reign on the Cabinet and Prime Minister--if a majority of the members of the House of Commons vote that they have lost confidence in the government, the Prime Minister must resign or ask for a national election to be scheduled.

Rarely will an individual Member of Parliament vote against his or her party. This party solidarity, known as the "Principle of Party Discipline," ensures that legislation promoted by the majority party will usually be passed, effectively building coalitions along party lines. The larger provinces (i.e. Ontario, Quebec) may have "federal cliques" with which members may affiliate themselves in some instances, rather than associating strictly by party. Opposition (minority party) members of Parliament essentially serve to keep the Government accountable for its actions, since the minority party can influence public opinion through debate and the introduction of new ideas to the government. The largest minority party in the House is formally known as Her Majesty's Loyal Opposition.

The Senate:

The Senate serves as a constitutional check on the House of Commons. This legislative body consists of 104 members appointed by the Prime Minister according to a regional allotment. Once appointed, Senators may continue to serve until they are 75 years of age. The Senate performs the technical function of reviewing legislation passed up from the House of Commons, but it does not commonly use its authority to veto or introduce new bills.

The Crown:

An overview of the Parliament would not be complete without a discussion of the Crown's (the Monarchy of England's) role. The Queen of England continues today to act as the symbolic head of the Commonwealth to which Canada belongs. The Governor General of Canada is appointed by the Queen, under the recommendation of the Prime Minister, to serve as the Queen's representative. The duties of the Governor General, although mostly symbolic and ceremonial, include protecting the best interests of the Canadian people. With this responsibility, the Governor General can dissolve Parliament if an impropriety or criminal action by the government occurs. This authority has seldom been wielded. If a party has obtained a majority of the seats in the House of Commons, the Governor General typically asks the leader of that party to form a government. If no majority party exists, the Governor General may choose a party to lead or may help establish a coalition government.

Although the Governor General officially summons and dissolves Parliament, this is done on the initiative of the Prime Minister. The Governor General delivers the "Speech from the Throne" to begin a new Parliament (much like the State of the Union Address in the U.S.), but the Prime Minister, in consultation with key advisors and ministers, determines the contents of the speech. The Governor General's final major political act is to approve or reject bills that pass both the Commons and the Senate. The Governor General's signature completes the legislative process and symbolically transforms the legislation into an Act of Parliament. All legislation passed by the Parliament refers within its text to the Governor General as the "Governor-in-Council."

Each province has a Lieutenant Governor who is appointed by the Governor General under the recommendation of the Provincial government. For the most part, the activities of the Lieutenant Governor mirror those of the Queen's national representative. The Lieutenant Governor is directly responsible to the federal government and may refuse to sign provincial legislation or may refer it to the federal Cabinet if the legislation is not in the best interests of the people of the province or the nation (White 1988). The Lieutenant Governor seldom uses this authority, and the day-to-day functions of this position are primarily symbolic.

B. THE NATIONAL GOVERNMENT

Prime Minister and Cabinet:

The Government of Canada consists of the Cabinet, or the Prime Minister and the Ministers appointed by the Prime Minister. (As mentioned previously, in Canada, the "Government" refers to the Prime Minister and Cabinet, as opposed to its broad definition in the U.S.) After a national election, the leader of the party that holds the greatest number of representatives in the House of Commons becomes Prime Minister.

The Prime Minister determines which members of Parliament, of the same party, will function as Ministers (i.e. Minister of Defense, or the Environment). A "Minister without Portfolio" refers to a cabinet member chosen for certain expertise but who does not serve as the head of any Ministry (this term may also be used to describe Ministers with the Provincial government). The major national governmental agencies are called Departments (as opposed to the Provincial Ministries) but are popularly referred to with the term "Canada" inserted into the title. For example, the department of the Environment is known as Environment Canada, and the department of Fisheries and Oceans is called Fisheries and Oceans Canada.

The Prime Minister is the head of the Cabinet, and decides who will occupy the national policy-making and administrative posts. The Prime Minister alone can determine the timing of an election within the five year term of Parliament, and has authority to reorganize government bureaucracy. Because the Prime Minister and Cabinet are drawn from the majority party in the House of Commons and can rely upon the principle of party discipline, Cabinet often dominates the legislative process as well as directs the executive branch (Gibbins 1988).

Cabinet members are collectively responsible for each and every decision reached by the Cabinet as a whole. Ministers who disagree with a consensus vote must publicly support the vote or resign from the cabinet. The internal cooperation among the Cabinet and the external coordination among the different parts of the Parliament generally enable the Prime Minister's proposed policies to sail smoothly through the legislative process. Although in theory the Cabinet is responsible to the Parliament, the House of Commons and the Senate have less input on legislation than does the Government. In fact, Cabinet members have the exclusive right to introduce tax legislation or legislation calling for the expenditure of public funds (Gibbins 1988). It has been observed that "Parliament debates government legislation before passing it, rather than debating to determine whether it should pass (Gibbins 1988)." Parliament's rejection of an executive proposal could lead to a vote of no-confidence and a national election (Jackson 1990).

C. THE JUSTICE SYSTEM

In the parliamentary democracy of Canada, the judicial system is separate from the legislative and executive branches of government. The provinces are responsible for prosecuting some violations of the federal criminal code, and define and administer civil law. At the federal level, the Supreme Court of Canada and Federal Court of Canada have national jurisdiction (White 1988). All crucial decisions concerning constitutional, criminal, and civil law are ultimately made in the Supreme Court. The court has eight cabinet-appointed judges and one Chief Justice. The Federal Court has a Chief Justice and an Associate Chief Justice. The twelve judges of the Federal Court's trial division hear cases in which citizens have a claim against the Crown, while the nine judges of the appeals division may hear appeals on decisions of the trial division. The appeals division may also hear appeals from federal agencies whose "decisions are challenged on the grounds of not adhering to accepted legal procedures and principles" (White 1988). It was not until 1949 that the Supreme Court of Canada became the final court of appeal (before then, all appeals on constitutional cases could be made to a council in the United Kingdom), and the Canadian Supreme Court has thus had less of an opportunity to create an important role for itself in the Constitutional process (White 1988).

D. ELECTIONS AND POLITICAL PARTIES

In Canada, national elections are held at least every five years. The Prime Minister dissolves Parliament and calls the elections at the most favorable opportunity for the governing party, usually within the fourth year after the last national vote. If timed correctly (i.e. when the party's policies have public support), this tradition helps to ensure that members of the government will be returned to office. A vote of no-confidence by the House of Commons could force the Prime Minister to resign or call for an election at an inopportune moment.

The Canadian political system is multi-party, with two consistently prominent national parties. These two dominant parties at the national level are the center-left **Liberals**, supporters of some public ownership with an emphasis on social legislation, and the center-right **Progressive Conservatives**, supporters of a laissez-faire philosophy with an emphasis on the private sector. From the early part of the century until 1984, the Liberals were the dominant party in the Parliament. Since 1984, however, the Progressive Conservatives have led the nation.

Over the last fifty years, the **New Democratic Party (NDP)** has also remained a firmly lodged political entity. This party is on the moderate left of the Canadian political spectrum and often acts as the nation's social conscience. It tends to initiate innovative ideas for social programs, like national health care, which may be too extreme for the major parties to support. Over time, however, these ideas are often developed into the Liberal or Conservative party platforms. The **Social Credit Party (Socred)** is further right in the political spectrum.

Although these minor parties have not had much federal success, they can be major players in provincial governments. For example, the New Democratic Party currently forms the government of British Columbia (the provincial Liberal Party has emerged as a political force for the first time in 30 years, forming the official opposition party), while the Social Credit party was previously in power in the province. In addition to these two parties, many smaller parties may be represented in Parliament or in legislative bodies around the nation.

E. PROVINCIAL AND TERRITORIAL GOVERNMENT

British Columbia:

The provincial government of British Columbia is structurally similar to the Canadian federal government, although the provincial parliament is a single-house legislature with no Senate (Figure 3). The province of British Columbia has 75 ridings (legislative districts), and thus has 75 elected members to the Legislative Assembly. The Members of the Legislative Assembly (MLA's) typically stem from the New Democratic Party (NDP), the Liberal Party, and the Social Credit Party (Socreds). As in any parliamentary system, the Premier is the leader of the majority party. Elections must be held every five years or sooner, at the discretion of the Premier and party.

The Premier appoints between 18-20 people to the cabinet, most of whom serve as the heads of specific Ministries. Due to the structure of the B.C. government, Cabinet members have more power to put forward legislation than do the individual members of the Legislative Assembly.

B.C. is divided into regional districts and municipalities, each of which has its own elected local officials. Municipalities are incorporated areas. Residents of unincorporated areas are governed in Districts, similar to "Counties" in the U.S. In 1990, an estimated three million people lived in British Columbia's 934,000 square kilometers (359,000 square miles), more than two-thirds of whom lived in the Fraser River Basin. The land mass of British Columbia represented about 10% of Canada, and its population of three million people represented about 11% of the nation's total.

The justice system is structured in three levels: the Court of Appeal, the Supreme Court, and Provincial Court.

The Yukon:

In the Yukon, 16 representatives are elected to the Territorial Legislative Assembly. The party with the most votes selects the Premier. In conjunction with the party caucus, the Premier appoints 5 other cabinet members, each of whom, including the Premier, direct two or three departments.

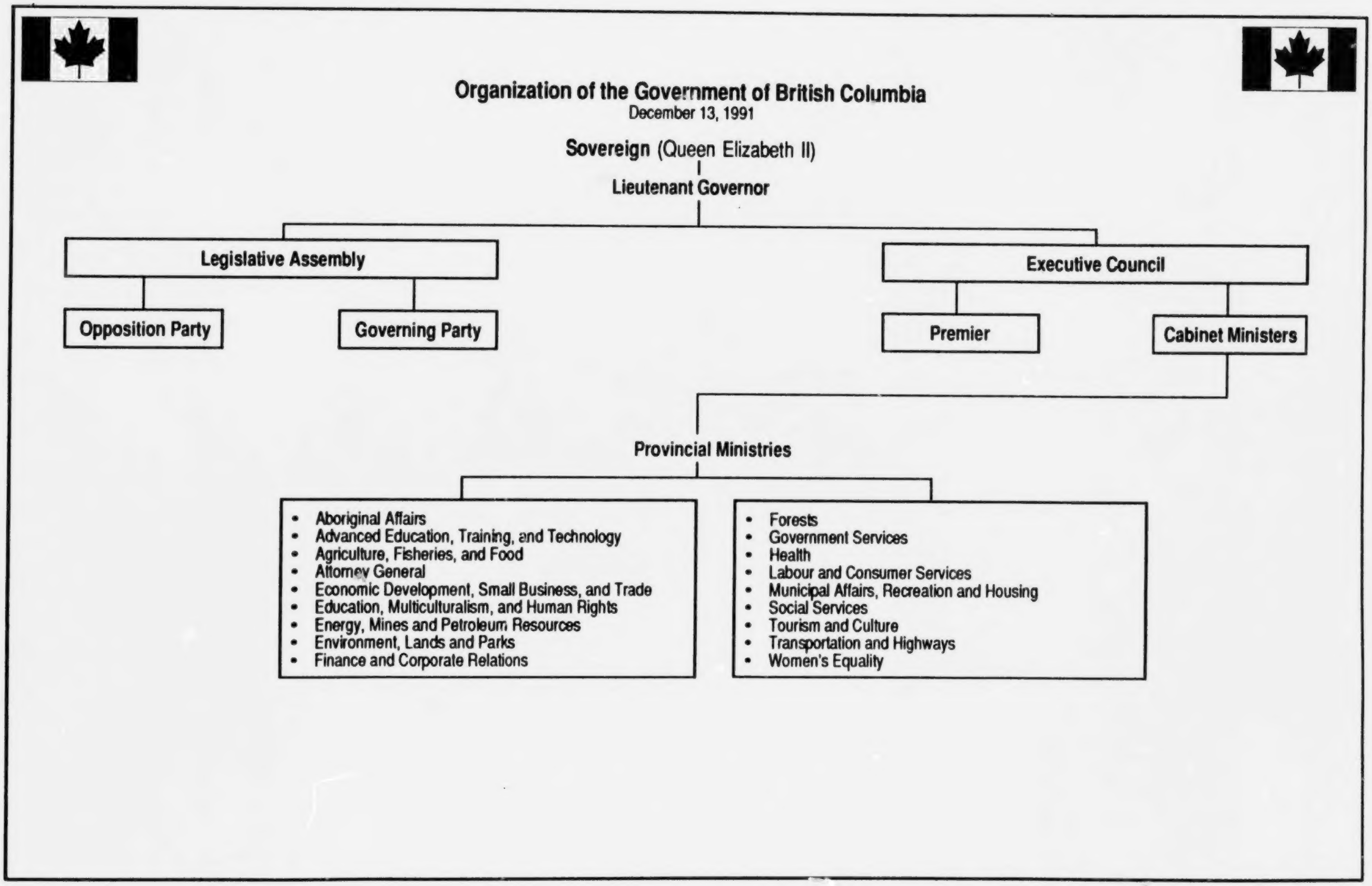
By constitution, the Yukon must hold an election every four years, but in the Parliamentary tradition they may call an election anytime. In the Yukon, the New Democratic Party currently forms the government, and the Progressive Conservatives are the opposition. In 1989, a estimated 25,700 people lived in the Yukon, the land area of which represented about 5% of the nation's total.

The Northwest Territories:

The Northwest Territories (N.W.T.) comprises 34% of Canada's land area but is home to less than 60,000 people. More than half of these residents are native people, with whom the Federal government is currently drawing up land claims (transferring land to native ownership). Once these claims are settled, N.W.T. will most likely be subdivided into several smaller units.

In the N.W.T., there are 24 elected members of the Territorial Legislative Assembly. The territory does not have a party system, rather, the legislature works through

Figure 3.
The Government of British Columbia


Organization of the Government of British Columbia
December 13, 1991
Sovereign (Queen Elizabeth II)
Lieutenant Governor
Legislative Assembly
Opposition Party
Governing Party
Executive Council
Premier
Cabinet Ministers
Provincial Ministries
Aboriginal Affairs
Advanced Education, Training, and Technology
Agriculture, Fisheries, and Food
Attorney General
Economic Development, Small Business, and Trade
Education, Multiculturalism, and Human Rights
Energy, Mines and Petroleum Resources
Environment, Lands and Parks
Finance and Corporate Relations
Forests
Government Services
Health
Labour and Consumer Services
Municipal Affairs, Recreation and Housing
Social Services
Tourism and Culture
Transportation and Highways
Women's Equality

consensus, and the Government Leader and the eight cabinet ministers are chosen by the entire Assembly (NWT 1990).

Both the Northwest and Yukon Territories have voting representatives in the Canadian House of Commons. The federal government plays a much stronger role in the management of these two entities than it does in any of the Provinces.

III. ENVIRONMENTAL REGULATION AND PROTECTION IN BRITISH COLUMBIA

A. CONSTITUTIONAL POWERS

The following section delineates the constitutional precedence for addressing pollution issues and natural resource management in British Columbia. While the Canadian Constitution specifically lists the resources over which the Provinces have control, the issue of which order of government has ultimate jurisdiction over environmental protection is one of constant debate.

Federal Powers:

The division of jurisdictional authority between federal and provincial levels of government in Canada was first laid out in the British North America Act of 1867, which was replaced by the Canadian Constitution Act, enacted by the Parliament of Canada in 1982 (FREMP 1990a). Environmental protection is managed under the Canadian Constitution Act which gives the federal government responsibility for navigation and shipping, seacoast and inland fisheries, lands reserved for indians, international relations, federal lands, and works "for the advantage of Canada" (Hunter 1987). These mandates, and the clause allowing Canadian Parliament to make laws for "peace, order and good government," give the federal government jurisdiction over migratory birds and issues of national concern such as ocean dumping, international and interprovincial pollution, and regulating all aspects of toxic chemicals.

Provincial Powers:

Under Canada's Constitution, the province has proprietary jurisdiction over all land, water, forests, minerals (non-renewable resources), and land covered by water, as well as the foreshore (land between low and high tides) and beds of inland coastal waters (FREMP 1990a). In British Columbia, about 90% of the land is provincially managed, or "owned by the Crown in right of the province," and the province has jurisdiction over most of the natural resources within it. In addition to jurisdiction over non-living resources, the Canadian Constitution also gives the provinces responsibility for "property and civil rights in the province." By common law, property has been determined to include fish (once they have been landed) and other living resources.

Thus, while the Constitution Act may give the provincial governments dominance in areas likely to affect (for example) air quality, the federal government may use its commerce and international responsibilities to also exercise control (Sinclair 1990). By way of their proprietary interest in natural resources, the provinces have jurisdiction over water. The federal government is also concerned with water quality through its jurisdictional responsibilities pertaining to navigation, northern development, fisheries, and authority for maintaining peace, order and good government (Sinclair 1990).

Some legal authorities have allocated control to the province for pollution management and other environmental issues:"...because pollution primarily affects property rights, the provincial governments must be regarded as having primary legislative responsibility" (Carroll 1979). Others have claimed that Parliament could and should assert authority with regard to pollution in the interests of general health, northern development, fisheries, and navigation (Sinclair 1990). Through the Constitution's "peace, order, and good government clause" recent Supreme Court of Canada decisions have granted authority over aspects related to marine pollution to the federal government.

The ambiguity of the Constitution regarding environmental regulation as well as 'overlapping jurisdiction in many areas of environmental management," has created a regulatory system characterized by cooperative management through protocol agreements, memos of understanding, and federal-provincial accords" (FREMP 1990a). As a result of concurrent authority, both levels of government have long been involved in the management of industrial and municipal wastes (FREMP 1990a).

B. MAJOR FEDERAL ENVIRONMENTAL LEGISLATION AND INITIATIVES

Although many federal laws and initiatives govern environmental protection at a national level, the following discussion summarizes three most significant to water quality protection.

The Fisheries Act:

The Fisheries Act, originating in the 1870's and revised as recently as 1991, is one of the "most significant federal statutes for controlling water pollution" (Hunter 1987). Section 36 of the Act states that "no person shall deposit a deleterious substance of any type in waters frequented by fish..." Deleterious substances are defined as those which would cause significant harm to fish or fish habitat if added to the water, and can include a variety of materials, from sediments to toxic contaminants. This section of the Act gives the federal government authority to regulate and monitor water quality, and has led to promulgation of a variety of federal regulations and guidelines, to be discussed in detail in this report.

The Fisheries Act defines fish as "shellfish, crustaceans, marine animals... and the eggs, sperm, spawn, larvae spat and juvenile stages of fish, shellfish, crustaceans, or marine animals." The federal government is responsible for marine and tidewater fisheries, marine fish habitat management, and freshwater habitat used by anadromous species, while in British Columbia, the federal government and province jointly manage freshwater sport fisheries. In the province, the Canadian Department of Fisheries and Oceans actively manages freshwater fish habitat, the provincial Ministry of Environment, Lands and Parks regulates recreational freshwater fisheries, and the Ministry of Agriculture, Fisheries, and Food manages freshwater commercial fisheries.

Fisheries and Oceans Canada. Environment Canada, and the public share the ability to invoke the Fisheries Act, however Fisheries and Oceans Canada has delegated much of the lead administrative authority for Section 36 of this Act to Environment Canada. Because the Province has significant constitutional jurisdiction over managing water quality, Environment Canada consults with the province when considering legal action under Section 36 of the Fisheries Act.

The Canadian Environmental Protection Act:

The Canadian Environmental Protection Act (CEPA) was enacted in 1988 and supersedes the Canadian Clean Air Act, Environmental Contaminants Act, Ocean Dumping Act, and Part III of the Canada Water Act. It is one of the most comprehensive federal environmental laws in Canada, and gives the federal government stronger jurisdiction over protecting the environment than the Fisheries Act alone provides.

CEPA serves as enabling legislation, allowing the federal environmental regulatory agency, Environment Canada, to design objectives, guidelines, and codes of practice for activities that affect the environment. It gives the federal government power to regulate 44 toxic substances listed as "priority chemicals" in the Act. Each "priority substance" must be assessed for toxicity by February 1994 to determine whether it should be placed on the List of Toxic Substances for possible regulation. CEPA gives Environment Canada authority to control all aspects of the life cycle of toxic substances, from development to their manufacture and ultimately to their disposal (Env. Can. 1988).

Prior to CEPA, Canadian industry could introduce a new substance into the country without informing the federal government (except pesticides, which were regulated under the Pest Control Products Act). Under CEPA, Environment Canada must assess all new substances for health and environmental safety and must establish or consider controls before the new substance can be used. CEPA also gives the federal government the authority to obtain information on, and require testing of, substances already existing (Env. Can. 1988).

CEPA prohibits ocean dumping except under the terms of a permit issued by Environment Canada. It also authorizes Environment Canada to research and collect data on air pollutants and to establish national ambient air quality objectives (FREMP 1990a). Under CEPA, air pollution can be controlled by the federal government if a violation of an international agreement results, or where the air pollution affects another country and reciprocal legislation exists to control the sources of the pollution.

Other authorities given the federal government under CEPA include:

- authority to regulate fuels and components of fuels;
- authority to regulate emissions, effluent, waste handling, and disposal practices of federal departments, boards, agencies, and Crown Corporations;
- provisions to create guidelines and codes for environmentally sound practices as well as objectives setting desirable levels of environmental quality;
- provisions to control nutrients in water conditioners or cleaning products which

can interfere with the use of waters by humans, animals, fish or plants (Env.Can 1988).

In addition the legislation authorizes the Minister of Environment to recognize provincial requirements as equivalent to regulations promulgated under CEPA. The federal and provincial governments will enter into agreements to ensure enforcement of the equivalent requirements. Where equivalent requirements do not exist, the federal government may enforce any national regulations that may be promulgated under the Act (Env. Can. 1988). Thus, through CEPA, Environment Canada (assisted in some cases by Health and Welfare Canada) may promulgate water quality guidelines, and must work with provincial governments to cooperatively manage water resources and share water quality monitoring activities.

CEPA gives Canadians a greater participatory role in environmental protection than they had previously. Any Canadian citizen can ask that a suspected toxic substance be added to the Priority Substances List and the government is required to act on the request and report its actions and findings. If an assessment determines that a substance should not be controlled, Canadian citizens can request a review of that decision.

The Green Plan:

Canada's Green Plan was released in 1990 and serves as a comprehensive plan of action for environmental protection by all federal government departments and agencies. It was developed by the Canadian Minister of the Environment, with consultation from a National Advisory Committee consisting of representatives from a variety of backgrounds and organizations.

The document lays out broad-based recommendations for improving environmental management, and provides for three billion dollars to be appropriated for implementation. Major objectives are divided into the following categories:

- Clean air, water, and land ($850 million);
- Sustainable use of renewable resources ($350 million);
- Protection of spaces and species ($175 million);
- Preserving the integrity of the northern territories ($100 million);
- Global environmental security ($575 million);
- Environmentally responsible decision-making at all levels of society ($500 million);
- Minimizing the impacts of environmental emergencies ($175 million); and
- Promoting environmental policies within federal government ($275 million)

For each objective, several targets are described, such as a "50 percent reduction in Canada's generation of waste by the year 2000," or "virtual elimination of the discharge of persistent toxic substances into the environment." One element of the Green Plan is the Fraser River Basin Action Plan, which addresses the clean-up and protection of the Fraser River in British Columbia. This Action plan is designed to bring together federal, provincial and local governments, as well as communities and industry to develop targets and schedules for remedial action plans.

Federal departments are expected to design methods for attaining the Green Plan's objectives. Although the Government of Canada is verbally committed to the Plan, actual implementation may be based upon budget constraints and higher priority political pressures.

C. FEDERAL ENVIRONMENTAL AGENCIES

Environment Canada:

The Canadian Department of the Environment, or Environment Canada, is the primary coordinator of federal policies and programs directed at the protection and restoration of environmental quality. This department is responsible for the Environmental Assessment Review Process and is authorized to act in a manner consistent with the following federal legislation:

- Fisheries Act
- Canada Water Act
- Canada Wildlife Act
- Canadian Environmental Week Act
- Canadian Environmental Protection Act
- Game Export Act
- Historic Sites and Monuments Act
- International River Improvements Act
- Lake of the Woods Control Board Act
- Migratory Birds Convention Act
- Weather Modification Information Act

As well as the authorities given it by federal law, Environment Canada administers some programs that have a national perspective such as meteorological services, collection of some environmental data, research, as well as environmental issues of international concern.

Headquartered in Ottawa, the federal Environment Department has five regional offices throughout the country. The Pacific and Yukon Office in Vancouver administers federal programs in B.C. and the Yukon, while the Western and Northern Office is located in Edmonton and oversees federal laws in the Provinces of Alberta, Saskatchewan, Manitoba, and the Northwest Territories.

At the national level the Minister of the Environment heads the organization. The Deputy Minister serves as the senior, non-elected official responsible for the management of the Department. Environment Canada is separated into three major entities--Conservation and Protection, Atmospheric and Environmental Services, and the Canadian Parks Service. These three elements are each headed by an Assistant Deputy

Minister (ADM) in Ottawa, each of whom has five regional directors (one for each region) who report to them. In the Pacific and Yukon Region, then, three major elements of Environment Canada exist, with a Regional Director General of Conservation and Protection, a Regional Director General of Atmospheric and Environmental Services, and a Regional Director General of the Park Service. These three Director Generals meet regularly as the Council of Regional Executives (CORE), and work together to implement the national programs of the Department of the Environment. Figure 4 shows the organizational structure of the Pacific and Yukon Region's Conservation and Protection, the Service whose programs are most relevant to this report. The functions of these three services are briefly described below.

1. The Atmospheric Environment Service provides information on weather, climate, sea state, ice conditions, and air quality.

2. Conservation and Protection is the major program in Environment Canada concerned with environmental regulation. This service promotes conservation and protection of inland waters, lands, and wildlife against the harmful effects of pollutants. Its jurisdiction includes water quantity and quality monitoring, aquatic research, flood damage reduction, river basin planing, land resources development, management of migratory birds, the protection of threatened and endangered species, and other national and international water and wildlife issues.

2a. The Environmental Protection subgroup of Conservation and Protection deals with air and water pollution and the release of toxic substances into the environment. The topic areas it addresses include agricultural and forestry pesticides; toxic chemicals; auto emissions; wastes from smelters, pulp and paper mills, mines, oil refineries, and other industry; ocean dumping; and broader issues of global warming, sustainable development, and "state of environment" reporting. This subgroup also implements and enforces the Canadian Environmental Protection Act and the pollution control provisions of the Fisheries Act.

2b. The Inland Waters Directorate works with provincial, territorial, and U.S. water management agencies to ensure that water development and use on either side of the border is not detrimental to downstream jurisdictions. It carries out river basin planning and flood damage reduction programs in cooperation with provincial governments. It is solely responsible for monitoring the quality and quantity of the aquatic environment, and has the responsibility to plan and conduct federal-provincial, inter-provincial, and international water management programs.

2c. The Canadian Wildlife Service protects migratory birds and their habitat, particularly through land acquisitions, hunting regulations, and monitoring toxic substances in waters used by migratory birds. The Service's focus on birds is a direct result of the Canada/U.S. Migratory Birds Convention, which makes the protection of migratory birds a federal responsibility.

3. The Canadian Parks Service establishes, develops and manages national parks, national historic parks, sites, canals and co-operative heritage areas.

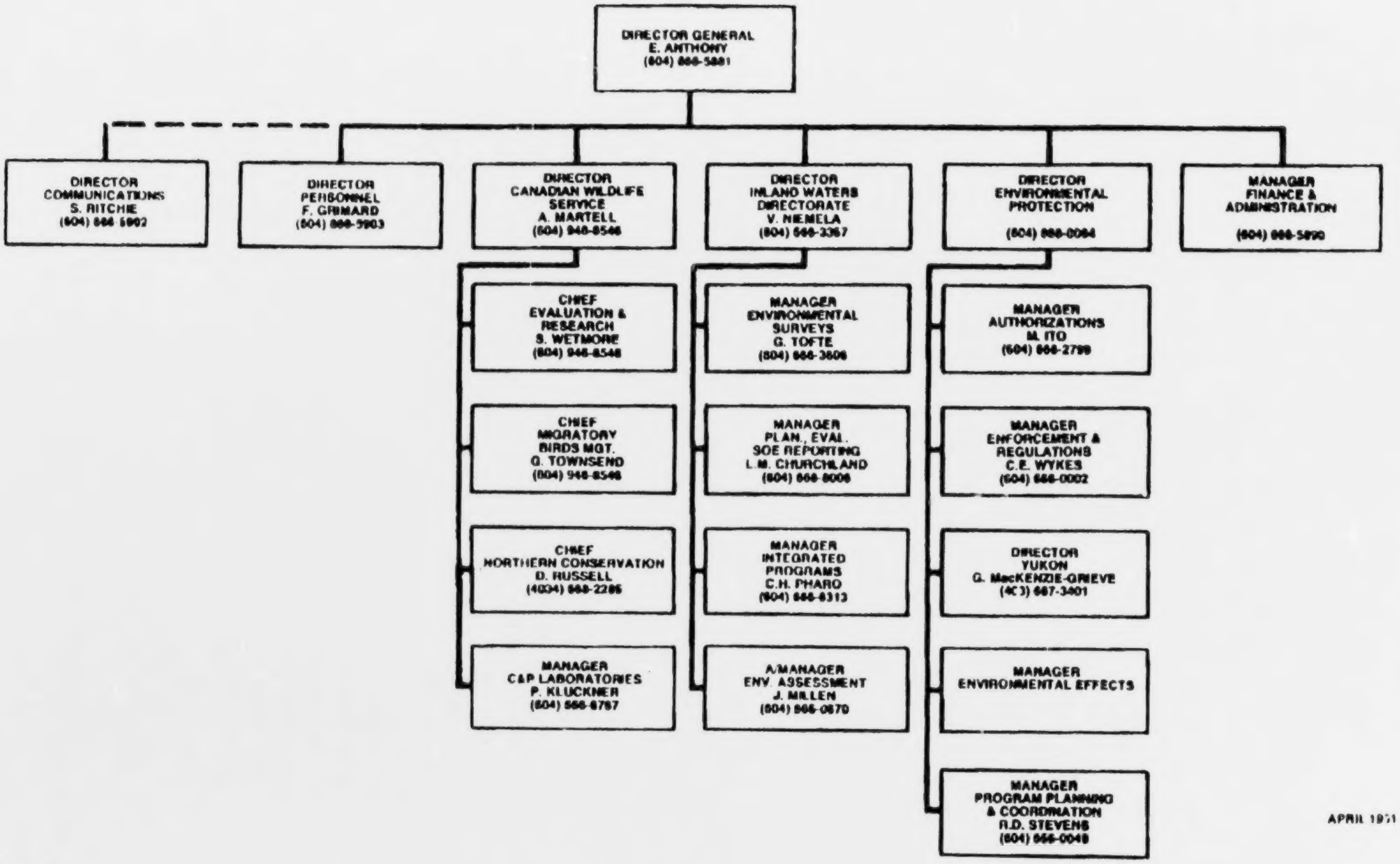

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Figure 4:
Organization of Environment Canada, Conservation & Protection, Pacific & Yukon Region

Other Federal Agencies:

Although Environment Canada has the main responsibility for environmental protection, all federal agencies are responsible for the environmental impacts of their activities, and some have major programs with important environmental objectives (Green Plan 1990). Other federal departments with significant roles in environmental regulation are listed below.

Transport Canada plays a significant role in the environmental review process. Due to the federal environmental review process, this department evaluates development permits for projects that may interfere with navigation. Because the term "navigable waters" is broadly defined, this department receives permit applications for many projects potentially affecting water and habitat quality. Transport Canada sends all permit applications to Environment Canada for comment, and requests that the applicant take into account the recommendations made by Environment Canada. Because the federal government might not otherwise have input on development permits, the role of Transport Canada helps to facilitate federal participation in development projects. Transport Canada is also responsible for administering the Canada Shipping Act, which contains measures to control pollution caused by maritime transportation and recreational boating. It is the lead federal agency on all marine spills, while Environment Canada provides support and advice regarding the environmental aspects of emergencies.

Agriculture Canada works with provincial governments and producers to preserve the agricultural resource base. It promotes soil conservation practices through programs like the National Soil Conservation Program, and administers the Pest Control Products Act by regulating pesticide registration, labelling, usage, and storage.

Energy, Mines, and Resources Canada funds projects that encourage energy efficiency, alternative energy, technology development, geological surveying, mapping, remote sensing, mineral recycling, waste management, and environmental assessment.

Fisheries and Oceans Canada administers the Fisheries Act, which authorizes the conservation and protection of fish and fish habitat. Through a memorandum of understanding, Environment Canada assumes the lead administrative role for implementing the pollution control provisions of the Act. The Department of Fisheries and Oceans (DFO) has responsibilities in enforcement, habitat and fish stock management, enhancement, and fisheries and habitat research. DFO participates in joint management initiatives such as the Fraser River Estuary Management Program as well as in international activities. The Department of Fisheries and Oceans also monitors marine mammal populations and is responsible for inspection of fish products for the consumer market.

Forestry Canada assists provincial governments with large-scale reforestation projects and also invests in research programs to improve and implement more economical and environmentally sensitive methods of managing forest ecosystems and controlling forest insects and diseases.

Health and Welfare Canada carries out health protection and medical services programs which include public awareness of the effects of pollutants on human health and the development of national guidelines on drinking water quality. Because environmental contaminants harm human health as well as the environment, Health and Welfare Canada also helps develop regulations for toxic substances under CEPA.

Indian and Northern Affairs Canada works to advance northern social economic and political development in conjunction with the territorial governments and through the co-ordination of federal policies and activities of federal departments and agencies. It is responsible for monitoring and developing strategies for federal/territorial relations, is involved in comprehensive land use planning, manages the natural resources of the territories (excluding forests and wildlife), and coordinates the development of oil and gas production. It places special emphasis on conserving and protecting the territories' environment. This department undertakes programs to enable Indian and Inuit people to respond to environmental problems affecting their reserve lands, waters, or traditional land-use areas.

The Harbor Commissions are largely autonomous federal entities, with provincial, federal, and local representation. These commissions manage development and dredging projects along some of the province's major waterways, and may also take the lead in some permit review processes. The Fraser River Harbor Commission and North Fraser Harbor Commission participate in issues related to the Fraser River.

Canadian Council of Ministers of the Environment (CCME) provides a forum for intergovernmental review and coordination of national and international environmental issues, and promotes consistent environmental policies across the nation. Environmental ministers from the ten provinces, two territories, and the federal government comprise the CCME. This council and its staff work to coordinate environmental policies across the nation, and helps to facilitate exchanges of ideas on federal and provincial policies. The CCME develops guidelines and recommendations upon which the provinces base their policies and legislation. For example, the CCME prepared a National Packaging Protocol requiring all jurisdictions to reduce packaging by 50% by the year 2000, is responsible for determining the allocation of sulphur dioxide reductions across the nation (to comply with the U.S./Canada Air Quality Treaty), and prepared national water quality guidelines that the provinces use in developing their water quality objectives.

D. MAJOR PROVINCIAL ENVIRONMENTAL LEGISLATION AND INITIATIVES

Because the province of British Columbia has jurisdiction over 90% of the lands within its boundaries, as well as the rights to most of the natural resources, the provincial government plays a major role in environmental management. Within the provinces, the federal government's regulatory powers pertain to federally owned lands, such as national parks, military bases and harbors, as well as those mandates included in the Constitution Act (navigation, international issues, peace-order-good government, etc.).

Although the Fisheries Act gives the federal government considerable latitude over water pollution from forestry, agriculture, and heavy industry, when "the federal government seeks to exercise this assumed power, it has frequently come into conflict with provincial governments, protective of their right to control their own resources" (Foster & Sewell 1981).

The Canadian Environmental Protection Act of 1988 gives the federal government greater control over regulating environmental pollution, and recent court decisions regarding the federal Environmental Assessment Review Process (EARP) expand the Canadian government's oversight authorities (see Part IX, Environmental Review Processes). Still, the tradition of provincial jurisdiction over provincial environmental matters still exists, and it is evident that some uncertainty continues concerning the responsibilities of the different levels of government in environmental matters.

Environmental legislation in British Columbia provides an administrative and regulatory framework for specific areas of environmental concern such as water management, waste management and wildlife management. Individual pieces of legislation provide for the development of regulations (which carry the force of law), or guidelines or standards (which are policy tools). Although the enforcement of environmental legislation and regulations is consistent throughout the Province, the application of guidelines or standards may vary to reflect site-specific or regional considerations.

B.C. Environment, Lands and Parks, the province's primary environmental ministry, is undertaking a comprehensive review of all environmental protection legislation under its jurisdiction. The primary objective of the review is to ensure that Ministry programs are supported by modern and effective legislation. The review exercise will also examine methods of enhancing program integration as well as the possibility of consolidating some Ministry statutes. The following section summarizes those provincial laws and initiatives currently most significant to managing water quality.

The Environmental Management Act, 1981:

This Act, in combination with the Ministry of Environment Act, serves as the enabling legislation for British Columbia's Ministry of Environment, Lands and Parks. It includes "provisions to develop environmental management plans and environmental guidelines, to require environmental impact assessment and to take action to prevent environmental damage." The Act also provides the Ministry with the authority to recover costs for environmental emergencies and to hold public hearings and inquiries (Harding 1987).

The Water Act, 1979:

Under this Act, the province "retains all rights to water except where the right to its use is granted by a water license issued by the Water Management Branch" of B.C. Environment, Lands and Parks (Harding 1987). This Act governs the use of water in the province, including surface water, lakes, streams, and groundwater.

The Waste Management Act, 1982:

The Waste Management Act gives the B.C. Ministry of the Environment, Lands and Parks authority to control the discharge of contaminants to land, water, or air. Under this Act, the Ministry can define what constitutes a polluted condition of water, land, or air and prescribe limits for discharge of various types of emissions and effluent (FREMP 1990a). Among other things, the Act enables the Ministry to regulate the confinement, storage, disposal and transportation of potentially hazardous wastes; to regulate spill prevention and reporting activities; to regulate certain contaminated site remediation activities; and to develop and operate an internal appeal process and an appeal process to the Environmental Appeal Board.

Permits issued under the Act contain terms and conditions under which discharges can occur, including effluent limits and monitoring requirements (FREMP 1990a). This Act formed the legislative basis for the formation of regional districts to address waste management (i.e. the Greater Vancouver Regional District and its Liquid Waste Management Plan).

The Wildlife Act, 1982:

The Ministry of Environment, Lands and Parks manages and protects the province's wildlife resources (with the exception of some fish resources managed by the federal government). To manage the wildlife, B.C. Environment, Lands and Parks can acquire and administer land as well as improvements on land and timber, timber rights, and other rights on private land. Specific duties under this act include development of regulations protecting wildlife, declaration and protection of endangered species, issuance of sport licenses, and the establishment and enforcement of quotas (B.C. Env. 1991a).

Environment 2001:

Although this program is not an "act of law," it is a significant government initiative released in 1991 by the B.C. Ministry of Environment, Lands and Parks. Similar in concept to Canada's Green Plan, Environment 2001 outlines British Columbia's commitment to a cleaner environment, performs a comparative risk assessment, and lists priorities for action. "Strategic actions and directions" include the following:

- a new and comprehensive B.C. Environmental Protection Act;
- more stringent waste management standards for solid, liquid, and hazardous wastes;
- an improved process for environmental impact assessment;
- a new Water Management Act (pertaining to quantity and allocation); and,
- consolidation of legislation covering wildlife and freshwater fisheries emphasizing sensitive habitats and endangered species.

Because this initiative was developed by the former B.C. government, officials are not certain which portions of the intiative, if any, will be relevant to the government elected in the fall of 1991.

E. PROVINCIAL ENVIRONMENTAL REGULATORY AGENCIES

The major provincial environmental player in British Columbia is the Ministry of Environment, Lands and Parks, but several other provincial Ministries manage and regulate environmental quality. B.C. Environment, Lands and Parks and those other provincial entities are discussed in detail below.

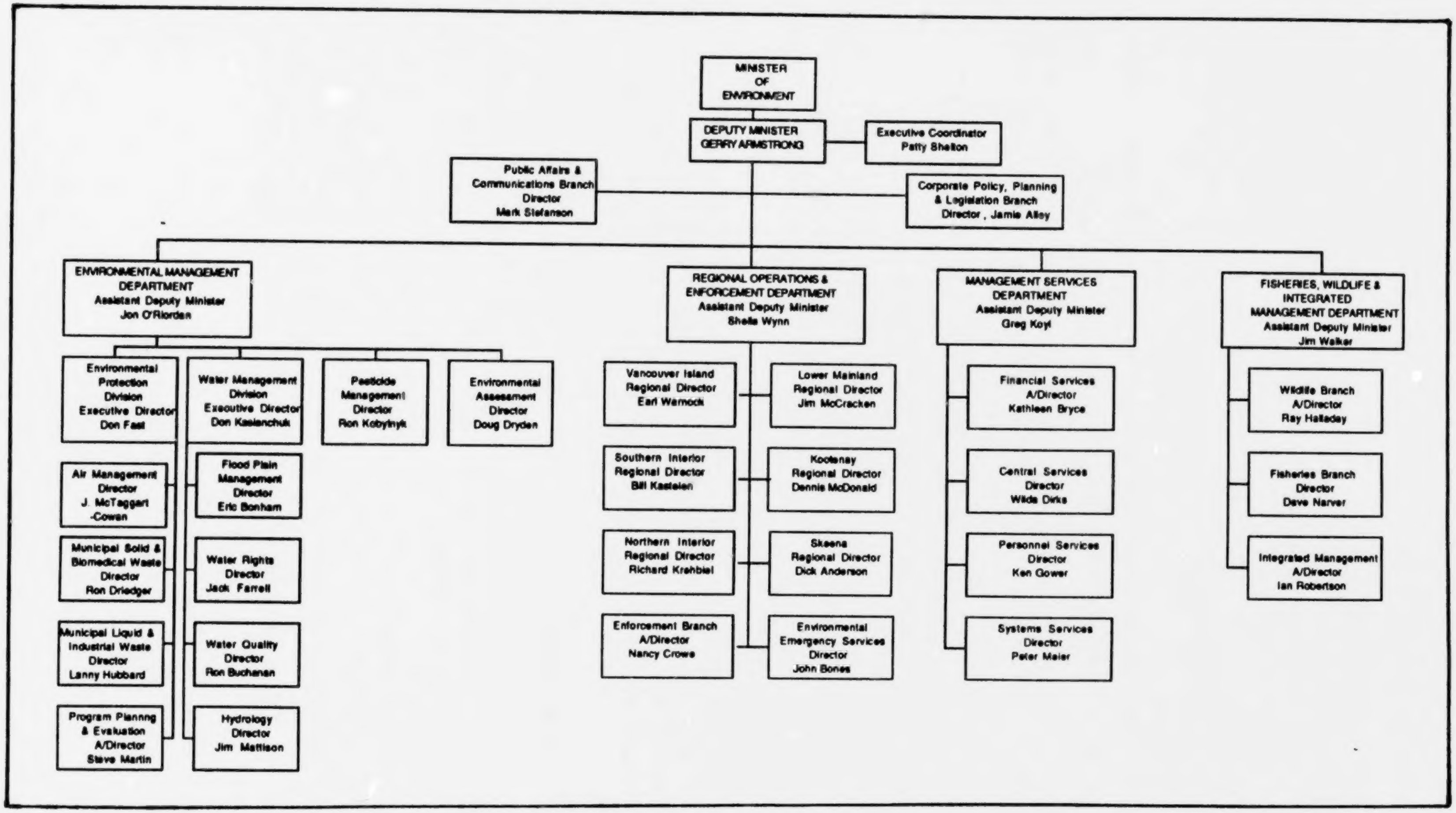
B.C. Environment, Lands and Parks:

This agency is similar in function to Washington's Department of Ecology, but also has responsibility for fish and wildlife protection and managing provincial lands, parks, recreational areas and ecological reserves. Under the provincial Environment Management Act (1981), the Ministry's specific legislated duties include research and investigative activities; developing environmental policies; and planning, designing, constructing, operating, and maintaining the required activities for the management, protection and enhancement of the environment. Major legislation affecting the Ministry of Environment, Lands and Parks includes:

- Ministry of Environment Act, 1980
- Environment and Land Use Act, 1979
- Environment Management Act, 1981
- Pesticide Control Act, 1979
- Waste Management Act, 1982
- Water Act, 1979
- Wildlife Act, 1982
- Fisheries Act (Canada), 1991
- Hazardous Waste Management Corporation Act, Bill 38- 1990

The Premier of British Columbia appoints the Minister of Environment, Lands and Parks. The Deputy Minister is one of the highest career civil servants and may be a political appointee. The Ministry is a consolidation of two ministries (Ministry of Environment and Ministry of Crown Lands and Parks) that existed prior to elections and government reorganization in October 1991. The structure of the new Ministry has not been finalized, but is partially outlined in Figure 5. B.C. Environment, Lands and Parks is divided into departments, including the Management Services Department, which takes care of administration and personnel, and policy development. Three departments are described below. As of this publication, it is not known how Lands and Parks will be assimilated into the Ministry.

Figure 5:
B.C. Environment, Lands and Parks – Environmental Programming


MINISTER OF ENVIRONMENT
DEPUTY MINISTER GERRY ARMSTRONG
Executive Coordinator Patty Shelton
Public Affairs & Communications Branch Director Mark Stefanson
Corporate Policy, Planning & Legislation Branch Director , Jamie Alley
ENVIRONMENTAL MANAGEMENT DEPARTMENT Assistant Deputy Minister Jon O'Riordan
Environmental Protection Division Executive Director Don Fast
Air Management Director J. McTaggart -Cowan
Municipal Solid & Biomedical Waste Director Ron Driedger
Municipal Liquid & Industrial Waste Director Lanny Hubbard
Program Planning & Evaluation A/Director Steve Martin
Water Management Division Executive Director Don Kasianchuk
Flood Plain Management Director Eric Bonham
Water Rights Director Jack Farrell
Water Quality Director Ron Buchanan
Hydrology Director Jim Mattison
Pesticide Management Director Ron Kobylnyk
Environmental Assessment Director Doug Dryden
REGIONAL OPERATIONS & ENFORCEMENT DEPARTMENT Assistant Deputy Minister Sheila Wynn
Vancouver Island Regional Director Earl Warnock
Lower Mainland Regional Director Jim McCracken
Southern Interior Regional Director Bill Kastelen
Kootenay Regional Director Dennis McDonald
Northern Interior Regional Director Richard Krehbiel
Skeena Regional Director Dick Anderson
Enforcement Branch A/Director Nancy Crowe
Environmental Emergency Services Director John Bones
MANAGEMENT SERVICES DEPARTMENT Assistant Deputy Minister Greg Koyl
Financial Services A/Director Kathleen Bryce
Central Services Director Wilda Dirks
Personnel Services Director Ken Gower
Systems Services Director Peter Meier
FISHERIES, WILDLIFE & INTEGRATED MANAGEMENT DEPARTMENT Assistant Deputy Minister Jim Walker
Wildlife Branch A/Director Ray Halladay
Fisheries Branch Director Dave Narver
Integrated Management A/Director Ian Robertson

1. The Environmental Management Department consists of four major divisions:

1a. Environmental Protection is chiefly responsible for waste discharge control and monitoring, solid and liquid waste management plan reviews, hazardous waste control, clean-up of contaminated sites and spills, enforcement of pollution regulations, and the development of air quality objectives.

1b. The Water Management Division regulates water quality and supply and works to control and reduce flooding and erosion.

1c. The Pesticide Control Branch promotes integrated pest management strategies and regulates pesticide use.

1d. The Environmental Assessment Branch presents a Ministry of Environment, Lands and Parks position on major project proposals by soliciting, reconciling, and explaining the comments of various potentially concerned branches of the Ministry. This branch represents the Ministry on energy project reviews, mining reviews, forestry development reviews, and regular permit applications for effluent and solid waste discharge, land and water development, and others.

2. Fisheries, Wildlife and Integrated Management Department, among other objectives, protects and enhances fish and wildlife habitat while managing species. This Department manages freshwater recreational fisheries, excepting salmon, and works to protect the province's wetlands.

3. Regional Operations and Enforcement Department manages the Ministry's programs at a more local level within the six regions of the Province. This department also contains the Enforcement Branch of the Ministry as well as the Environmental Emergency Services Branch, which responds to spills of hazardous materials.

Other Provincial Agencies:

The policies and responsibilities of other Ministries also address environmental protection and management. The following provincial Ministries are the most significant with respect to the environment.

Ministry of Agriculture, Fisheries and Food promotes markets and regulates quality and prices for agricultural and fish products. It plays a role in environmental management through development of soil and water conservation guidelines; education on pesticide, fertilizer, and herbicide use; and assisting in the design of agricultural waste management regulations (MoAF 1990). The Ministry also regulates freshwater commercial fishing and all aquaculture activities.

Ministry of Forests administers provincial forests, which comprise 87 percent of British Columbia's land base. The ministry integrates the management of timber, range, recreation, water, fish, wildlife, and others. Its primary concern is protection, management, and harvest of timber resources.

Ministry of Health and Minister Responsible for Seniors has responsibility for such things as drinking water supplied by purveyors, quality of bathing beaches, and sewage discharges up to 5,000 gallons/day.

Ministry of Energy, Mines and Petroleum Resources ensures that the province's energy and mineral resources are developed and used in a safe, efficient and environmentally sound manner for the economic benefit of the province. The ministry provides advice and technical services to aid in the development of the province's metals, minerals, coal, petroleum, natural gas and other energy and mineral resources.

F. ENVIRONMENTAL PROTECTION IN THE YUKON AND NORTHWEST TERRITORIES

Indian and Northern Affairs Canada:

In both the Yukon and Northwest Territories, most of the land is federally owned, and is managed by the Canadian Department of Indian and Northern Affairs, under the Northern Inland Waters Act and Territorial Lands Act. Indian and Northern Affairs Canada has jurisdiction over the natural resources of the territories, excluding wildlife, and is the senior federal presence in the territories (NWT 1990).

Environment Canada:

Environment Canada plays a secondary federal role in natural resource protection in the Territories. Much of its mandate in the territories comes from the Canadian Environmental Protection Act and from the Fisheries Act. This department also has jurisdiction over transboundary hazardous waste transportation and environmental assessments. Environment Canada's Pacific and Yukon Regional Office addresses issues in the Yukon, while the Western and Northern Regional Office, located in Edmonton, addresses issues in the Northwest Territories.

Department of Fisheries and Oceans:

Under the Fisheries Act, the DFO manages fish and fish habitat, including water quality, from its Pacific, and Central and Arctic Region Offices.

Department of Renewable Resources:

This territorial Department exists in both Territories to manage and regulate the sustainable development of wildlife and to provide environmental protection measures, mainly with regards to health and safety (NWT 1990). When a wildlife population migrates across territorial or international boundaries, it becomes a federal as well as territorial responsibility.

In May 1991, the Yukon government enacted an Environmental Protection Act, which enables the government to regulate activities on Yukon lands. Yukon lands are mainly those lands surrounding municipalities (the federal government manages other lands). The Environmental Protection Act addresses issues such as air and water quality, waste management, and litter. As part of the Green Plan, Indian and Northern Affairs Canada drew up the Arctic Environmental Strategy Action Plan, which pertains to federal lands and federal activities. In both territories, the Minister of Renewable Resources serves as the representative on the Canadian Council of Ministers of the Environment (CCME) and this Minister communicates with Federal, Provincial, and Territorial environmental officials.

PART IV. INTRODUCTION TO THE UNITED STATES GOVERNMENT

In 1776 the thirteen British colonies in America united to formally declare their independence from Great Britain. The colonies won their liberty after several years of war, and the United States Constitution was ratified in 1789, about 80 years prior to the formal establishment of Canada. This constitution divided the power to make laws between the central government and the states and outlined a government notable for its separation of powers and system of checks and balances.

One hundred years after the nation's government was formally organized, the state of Washington was admitted to the Union. The U.S.'s fiftieth and most recent state, Hawaii, was admitted in 1959. The Commonwealth of Puerto Rico and America's territories, (Guam, American Samoa, and the Virgin Islands) have some voting rights in the U.S. Congress, while the Trust Republic of Palau, the Commonwealth of the Northern Mariana Islands, the Republic of the Marshall Islands, and the Federated States of Micronesia participate in some U.S. government programs, but lack voting rights.

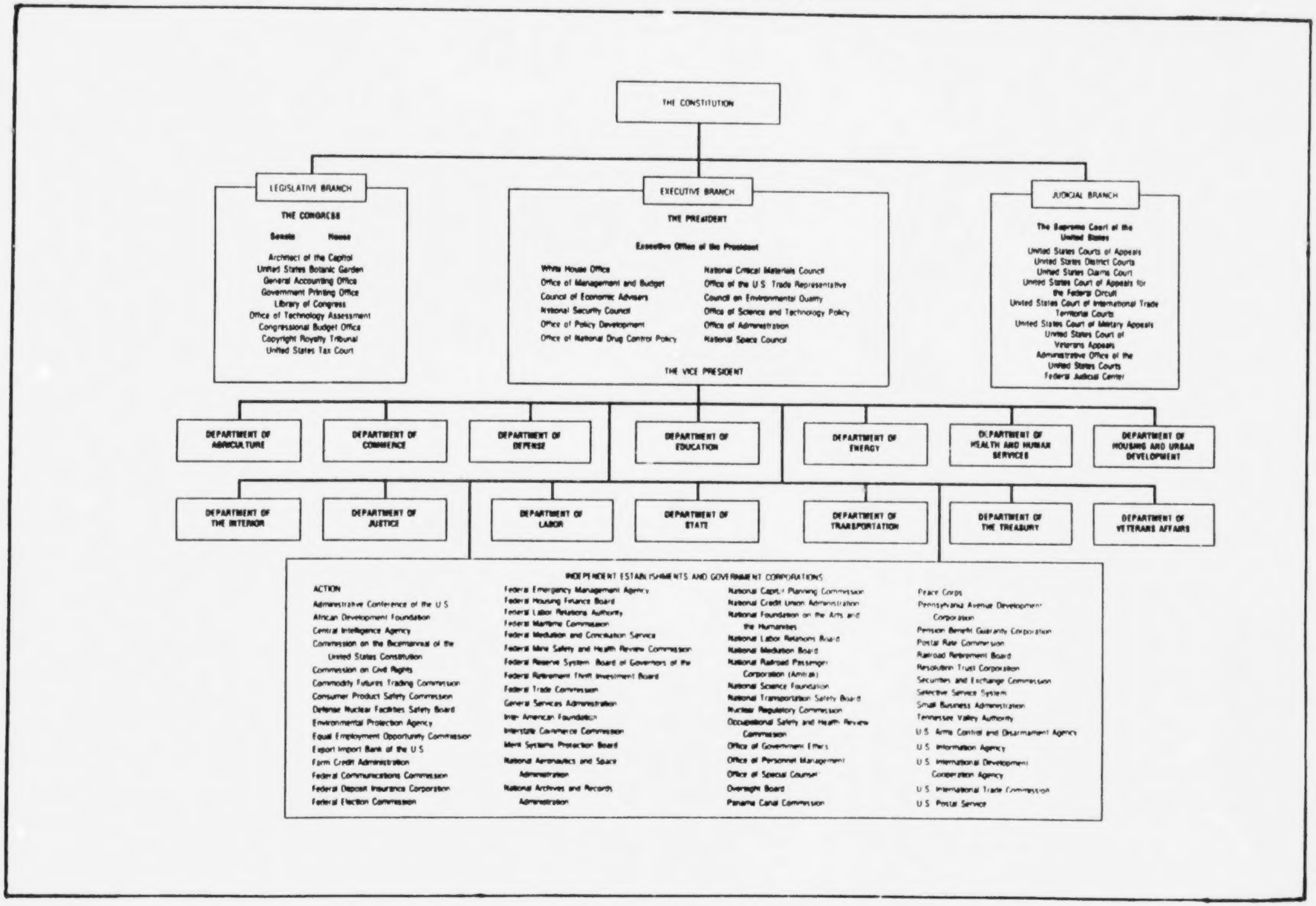
The U.S. Constitution proclaims the powers of the national government and the jurisdictions of the states, and declares that all powers not specifically given to the national government nor prohibited to the states are under the jurisdiction of the states. Even so, the federal government of the U.S. plays a strong role in the affairs of the states, particularly regarding environmental protection, as will be discussed later.

The basic powers of government in the United States are divided among three independent but equal branches (Figure 6). These branches are known as the legislative, executive, and judicial branches. They are tied together through a complex system of checks or restraints that each may use against the other. The writers of the U.S. Constitution saw this division of power as necessary to avoid the "accumulation of powers into the same hands", which they considered "tyranny" (McClenaghan 1988). Unlike the Canadian Parliamentary system, which allows the electorate to vote for only one national office, in the U.S., citizens vote for three representatives at the national level: one Senator, one member of the House of Representatives, and the President. Members of the federal judicial branch are appointed by the President rather than elected by the people.

A. FEDERAL JUDICIAL BRANCH

The judicial branch of government includes the nation's courts. The highest courts have the power of judicial review--the power to decide whether government activities comply with the Constitution. Federal judges are appointed by the President, but must be approved by the Senate. Among the courts' many objectives, the judicial branch can be used by federal agencies and citizen groups to ensure that laws passed by Congress are implemented by federal agencies.

Figure 6:
Organization of the U.S. Government (from U.S. Government Manual, 1989)


THE CONSTITUTION
LEGISLATIVE BRANCH
THE CONGRESS
Senate
House
Architect of the Capitol
United States Botanic Garden
General Accounting Office
Government Printing Office
Library of Congress
Office of Technology Assessment
Congressional Budget Office
Copyright Royalty Tribunal
United States Tax Court
EXECUTIVE BRANCH
THE PRESIDENT
Executive Office of the President
White House Office
Office of Management and Budget
Council of Economic Advisers
National Security Council
Office of Policy Development
Office of National Drug Control Policy
National Critical Materials Council
Office of the U.S. Trade Representative
Council on Environmental Quality
Office of Science and Technology Policy
Office of Administration
National Space Council
THE VICE PRESIDENT
JUDICIAL BRANCH
The Supreme Court of the United States
United States Courts of Appeals
United States District Courts
United States Claims Court
United States Court of Appeals for the Federal Circuit
United States Court of International Trade
Territorial Courts
United States Court of Military Appeals
United States Court of Veterans Appeals
Administrative Office of the United States Courts
Federal Judicial Center
DEPARTMENT OF AGRICULTURE
DEPARTMENT OF COMMERCE
DEPARTMENT OF DEFENSE
DEPARTMENT OF EDUCATION
DEPARTMENT OF ENERGY
DEPARTMENT OF HEALTH AND HUMAN SERVICES
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
DEPARTMENT OF THE INTERIOR
DEPARTMENT OF JUSTICE
DEPARTMENT OF LABOR
DEPARTMENT OF STATE
DEPARTMENT OF TRANSPORTATION
DEPARTMENT OF THE TREASURY
DEPARTMENT OF VETERANS AFFAIRS
INDEPENDENT ESTABLISHMENTS AND GOVERNMENT CORPORATIONS
ACTION
Administrative Conference of the U.S.
African Development Foundation
Central Intelligence Agency
Commission on the Bicentennial of the United States Constitution
Commission on Civil Rights
Commodity Futures Trading Commission
Consumer Product Safety Commission
Defense Nuclear Facilities Safety Board
Environmental Protection Agency
Equal Employment Opportunity Commission
Export Import Bank of the U.S.
Farm Credit Administration
Federal Communications Commission
Federal Deposit Insurance Corporation
Federal Election Commission
Federal Emergency Management Agency
Federal Housing Finance Board
Federal Labor Relations Authority
Federal Maritime Commission
Federal Mediation and Conciliation Service
Federal Mine Safety and Health Review Commission
Federal Reserve System, Board of Governors of the
Federal Retirement Thrift Investment Board
Federal Trade Commission
General Services Administration
Inter-American Foundation
Interstate Commerce Commission
Merit Systems Protection Board
National Aeronautics and Space Administration
National Archives and Records Administration
National Capital Planning Commission
National Credit Union Administration
National Foundation on the Arts and the Humanities
National Labor Relations Board
National Mediation Board
National Railroad Passenger Corporation (Amtrak)
National Science Foundation
National Transportation Safety Board
Nuclear Regulatory Commission
Occupational Safety and Health Review Commission
Office of Government Ethics
Office of Personnel Management
Office of Special Counsel
Oversight Board
Panama Canal Commission
Peace Corps
Pennsylvania Avenue Development Corporation
Pension Benefit Guaranty Corporation
Postal Rate Commission
Railroad Retirement Board
Resolution Trust Corporation
Securities and Exchange Commission
Selective Service System
Small Business Administration
Tennessee Valley Authority
U.S. Arms Control and Disarmament Agency
U.S. Information Agency
U.S. International Development Cooperation Agency
U.S. International Trade Commission
U.S. Postal Service

B. FEDERAL EXECUTIVE BRANCH

President and Vice President:

The President and Vice President of the United States run for office together and are elected for a four year term. Presidential candidates are nominated by the major parties (see below) at separate National Conventions. The Vice Presidential candidates are usually selected by the nominated Presidential candidate in a strategic effort to garner more electoral votes, often with less consideration given to qualifications (McClenaghan 1988). Once elected, the President is not allowed to serve more than two consecutive terms.

The President's powers stem from the Constitution, acts of Congress, and from historical convention. The President appoints and removes major cabinet officers, makes treaties and conducts foreign relations, keeps peace between the states, acts as Commander in Chief of the military, directs administration, and executes and enforces the law. The President also has the ability to recommend legislation and to approve or veto acts of Congress. If the President chooses to veto a bill, the measure is sent back to Congress. Congress can pass the bill over the President's veto by a two-thirds vote of the members present, but it is typically difficult for the bill's proponents to garner this number of votes to override a veto (McClenaghan 1988). The President's veto power gives the executive branch great influence over legislation, as members of Congress may try to tailor a bill to conform closely to the President's wishes in order to avoid excess delay in its passage. Although the President may allow a bill to become law without signing it, a bill automatically becomes law with the President's signature.

The Vice President succeeds to the Presidency if the President is no longer able to carry out the duties of office. The Vice President typically carries out social, political, diplomatic, and administrative chores for the President (McClenaghan 1988). In addition to these responsibilities, the Vice President serves as the Presiding Officer of the Senate.

Cabinet:

The President appoints most of the top-ranking officials of the Federal Government, with Senate consent. Among these politically appointed government employees are cabinet members, known as Secretaries, and the heads of independent agencies (like the Environmental Protection Agency). Currently there are fourteen executive departments and thus fourteen cabinet members. Cabinet members do not serve as the only political advisors to the President; other advisory officials include the Chief of Staff, the Director of the Office of Management and Budget, and the Vice President (McClenaghan 1988).

C. FEDERAL LEGISLATIVE BRANCH

The legislative branch of the national government consists of the two houses of Congress--the Senate and the House of Representatives. Members of both houses are elected directly by the people, Senators for six year terms and Representatives for two year terms.

The Senate:

The U.S. Senate is composed of 100 members, two from each state. Terms are staggered, one third of the Senate is up for election every two years. Under the Constitution, the Senate is granted power to approve or disapprove certain Presidential appointments by a majority vote, and must also concur to any treaty by a two-thirds vote before it becomes ratified.

The House of Representatives:

The House consists of 435 members, apportioned among the states according to population, with each state guaranteed at least one Representative. Each member is elected for a two-year term, and members are up for election at the same time. The House of Representatives has the power of originating all bills for the raising of revenue, a power that the Senate does not have.

The work of preparing and considering legislation is done mainly by committees of both houses of Congress. In 1989, there were 16 standing committees in the Senate and 22 in the House of Representatives. Membership into each House's standing committees is voted upon by the entire body of the relevant house. Members of other types of Committees (i.e. investigative, joint, etc.) are appointed according to the legislation establishing the committee (US OFR 1989). Each proposed bill and resolution is usually referred to the appropriate committee, which may or may not amend the bill, or may choose not to send it out of committee, effectively killing it (US OFR 1989). All bills and joint resolutions must pass both the House and the Senate. If the President vetoes the bill, it must be passed by a two-thirds vote of both Houses of Congress in order to become law without the President's signature.

Together, the Senate and House of Representatives comprise the United States Congress, the branch of U.S. government closest to the people and thus the most influenced by public opinion and interest groups. Members of the U.S. political parties generally do not share the same strong party loyalties of their Canadian counterparts, resulting in a less expedient political process, and one more open to outside interests.

D. ELECTIONS AND POLITICAL PARTIES

In the U.S., elections for President are held every four years. Senators serve six year terms, and Representatives must run every two years. Thus, elections for national offices typically occur on a more frequent basis than in Canada, where all members of Parliament run at once, in national elections that occur every four or five years (unless a vote of no-confidence occurs or the Prime Minister calls an election when support is high). Elected officials remain in office for the duration of their term, regardless of public support or the popularity of their political party. Although the President is restricted to two terms in office, Senators and Representatives may be in Congress for their entire careers.

The President and Vice President are not elected by popular vote but rather through the "electoral college." Every state has a number of electoral votes based upon the number of representatives it has in Congress (2 for the Senate and one for each member of the House). Voters in each state vote for the electors, rather than directly for the candidates. The electors in each state are members of the political party that wins the majority of votes in that state. About one month after the popular election, the electors vote for their candidates. Thus, the Presidential candidates receive blocks of electoral votes, such as 11 votes from Washington, or 48 from California, and are elected based upon who has the majority of electoral votes. Although it has not happened in the twentieth century, it is possible for a President to win a majority of electoral votes without winning the popular vote.

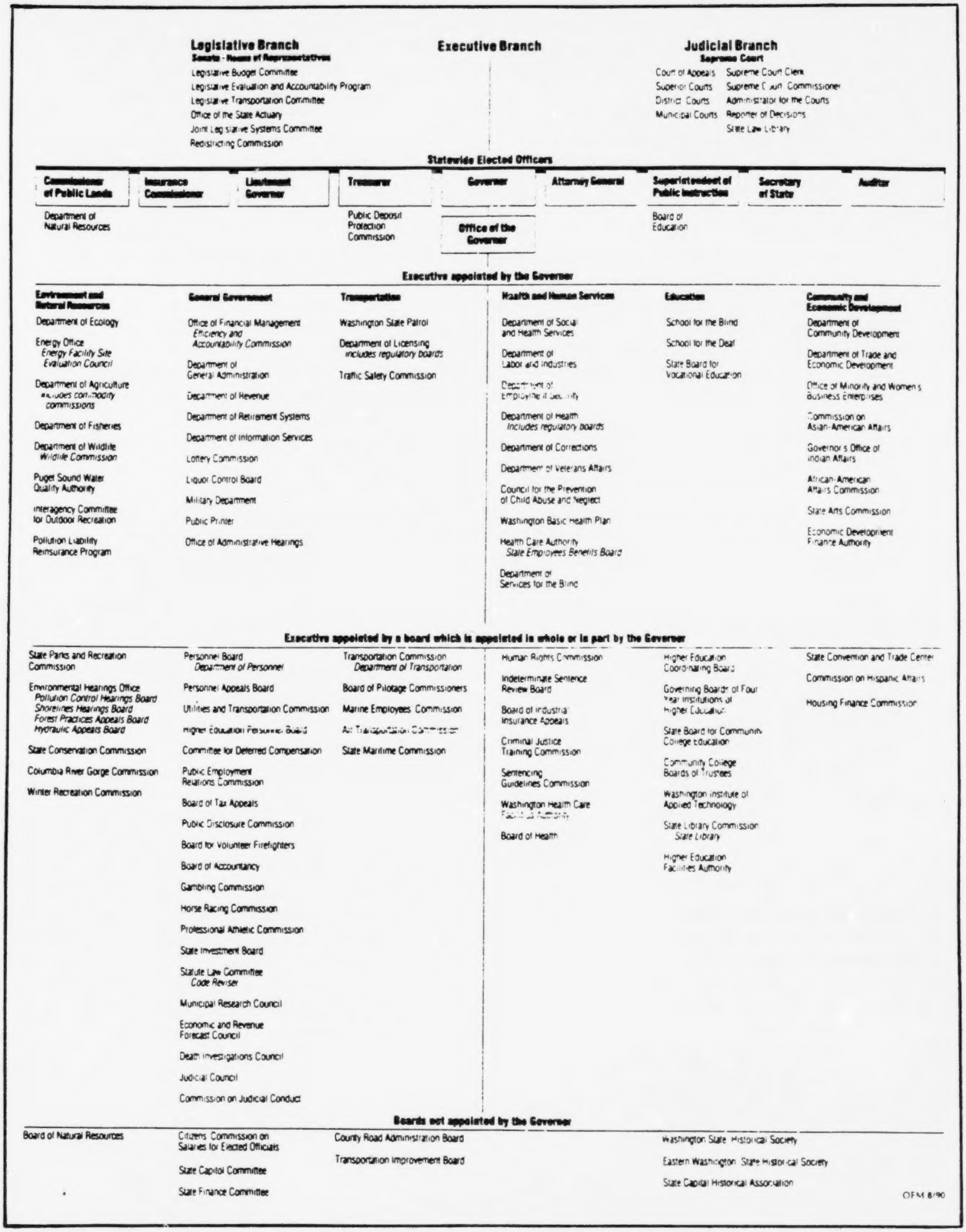
The American political system is a two-party system, dominated by the Democratic and Republican parties. Although other parties exist, in the typical election (whether national, state, or local), a member of one of the two major parties has the best chance of winning (McClenaghan 1988). In some cases, a candidate may run as an Independent, unaffiliated with a political party (the current Governor of Alaska, Walter Hickel, was an Independent candidate).

The Republican party is the more conservative of the two parties, historically favoring private enterprise and a lesser role for government in the economy. Both Ronald Reagan, the United States President from 1980-1988 and George Bush, President since 1988, are leaders of the Republican party. The more liberal Democrats have held the majority of seats in Congress during the last ten years, creating friction between the legislative and executive branches.

E. WASHINGTON STATE GOVERNMENT

According to the United States Constitution, "the powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the states respectively, or to the people." Washington became a state in 1889, with Olympia as its capital. Modeled after the federal government, every state has three separate but equal branches of government. Washington has a two-house legislature, a court system, and an executive branch consisting of a governor, lieutenant governor, and seven elected department heads (LWV 1988).

Figure 7:
Washington State Government



Legislative Branch
Senate - House of Representatives
Legislative Budget Committee
Legislative Evaluation and Accountability Program
Legislative Transportation Committee
Office of the State Actuary
Joint Legislative Systems Committee
Redistricting Commission

Executive Branch

Judicial Branch
Supreme Court
Court of Appeals
Superior Courts
District Courts
Municipal Courts
Supreme Court Clerk
Supreme Court Commissioner
Administrator for the Courts
Reporter of Decisions
State Law Library

Statewide Elected Officers

Commissioner of Public Lands
Department of Natural Resources

Insurance Commissioner

Lieutenant Governor

Treasurer
Public Deposit Protection Commission

Governor
Office of the Governor

Attorney General

Superintendent of Public Instruction
Board of Education

Secretary of State

Auditor

Executive appointed by the Governor

Environment and Natural Resources
Department of Ecology
Energy Office
Energy Facility Site Evaluation Council
Department of Agriculture
includes commodity commissions
Department of Fisheries
Department of Wildlife
Wildlife Commission
Puget Sound Water Quality Authority
Interagency Committee for Outdoor Recreation
Pollution Liability Reinsurance Program

General Government
Office of Financial Management
Efficiency and Accountability Commission
Department of General Administration
Department of Revenue
Department of Retirement Systems
Department of Information Services
Lottery Commission
Liquor Control Board
Military Department
Public Printer
Office of Administrative Hearings

Transportation
Washington State Patrol
Department of Licensing
includes regulatory boards
Traffic Safety Commission

Health and Human Services
Department of Social and Health Services
Department of Labor and Industries
Department of Employment Security
Department of Health
Includes regulatory boards
Department of Corrections
Department of Veterans Affairs
Council for the Prevention of Child Abuse and Neglect
Washington Basic Health Plan
Health Care Authority
State Employees Benefits Board
Department of Services for the Blind

Education
School for the Blind
School for the Deaf
State Board for Vocational Education

Community and Economic Development
Department of Community Development
Department of Trade and Economic Development
Office of Minority and Women's Business Enterprises
Commission on Asian-American Affairs
Governor's Office of Indian Affairs
African-American Affairs Commission
State Arts Commission
Economic Development Finance Authority

Executive appointed by a board which is appointed in whole or in part by the Governor

State Parks and Recreation Commission
Environmental Hearings Office
Pollution Control Hearings Board
Shorelines Hearings Board
Forest Practices Appeals Board
Hydraulic Appeals Board
State Conservation Commission
Columbia River Gorge Commission
Winter Recreation Commission

Personnel Board
Department of Personnel
Personnel Appeals Board
Utilities and Transportation Commission
Higher Education Personnel Board
Committee for Deferred Compensation
Public Employment Relations Commission
Board of Tax Appeals
Public Disclosure Commission
Board for Volunteer Firefighters
Board of Accountancy
Gambling Commission
Horse Racing Commission
Professional Athletic Commission
State Investment Board
Statute Law Committee
Code Reviser
Municipal Research Council
Economic and Revenue Forecast Council
Death Investigations Council
Judicial Council
Commission on Judicial Conduct

Transportation Commission
Department of Transportation
Board of Pilotage Commissioners
Marine Employees' Commission
Air Transportation Commission
State Maritime Commission

Human Rights Commission
Indeterminate Sentence Review Board
Board of Industrial Insurance Appeals
Criminal Justice Training Commission
Sentencing Guidelines Commission
Washington Health Care Facilities Authority
Board of Health

Higher Education Coordinating Board
Governing Boards of Four Year Institutions of Higher Education
State Board for Community College Education
Community College Boards of Trustees
Washington Institute of Applied Technology
State Library Commission
State Library
Higher Education Facilities Authority

State Convention and Trade Center
Commission on Hispanic Affairs
Housing Finance Commission

Boards not appointed by the Governor

Board of Natural Resources

Citizens' Commission on Salaries for Elected Officials
State Capitol Committee
State Finance Committee

County Road Administration Board
Transportation Improvement Board

Washington State Historical Society
Eastern Washington State Historical Society
State Capital Historical Association

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Judicial Branch:

The courts of the state constitute the judicial branch of government. Nine justices comprise the state of Washington's Supreme Court, which has administrative power over all other state courts. The judicial branch interprets the law and determines compliance with and constitutionality of laws, in addition to resolving conflicts over legal rights and determining punishments for crimes (LWV 1988).

Executive Branch:

The executive branch administers state agencies and enforces state laws, and is headed by nine independently elected officials, including the Governor (Figure 7). Elections occur in presidential election years. All executive branch officials serve four year terms, with no limit on number of terms served (LWV 1988).

Governor: The Governor is the counterpart to the Premier in British Columbia. The governor's office executes and enforces the laws and management of state governmental activities not assigned to the other eight officers or to an independent agency. Between elections, the Governor appoints a successor to any vacancy in the other elective offices. The governor has the power to appoint over 600 public officials, and to call special sessions of the legislature. The budget for the branches of state government originates in the governor's office (LWV 1988).

The governor has legislative powers, as all bills that the legislature passes must be approved by the Governor before becoming law. The governor in Washington has the authority to veto an entire piece of legislation or single sections or subjects (LWV 1988).

Most of the functions of the executive branch are carried out by administrative departments, agencies, boards, and commissions. Except for the seven elected officials, heads of these agencies are appointed by the Governor (some must be confirmed by the Senate), and can be fired by the governor. Most of these administrative entities can be abolished by the state legislature (LWV 1988).

Lieutenant Governor: The Lieutenant Governor is independently elected (unlike the U.S. Vice President), is president of the state Senate, chairs the Senate Rules Committee, and is first in line to assume the duties of governor in case of death, disability, or removal from office. This person acts as governor, with all the powers of the governor, when the governor is out of the state (LWV 1988).

Other independently elected officials in the Executive Branch include:

- Commissioner of Public Lands
- Secretary of State
- Treasurer
- Auditor
- Attorney General

- Superintendent of Public Instruction, and
- Insurance Commissioner

The budgets of these offices are controlled by the legislature and the governor. Under the state constitution, the legislature can, at its discretion, abolish the offices of Lieutenant Governor, Auditor, and Commissioner of Public Lands (LWV 1988).

Legislative Branch:

The legislature consists of the House of Representatives and the Senate. State representatives serve two year terms and are elected in even numbered years. Senators are elected every four years, with overlapping terms so that half of the Senate is elected every two years. There are 98 members of the House, and 49 members of the Senate (LWV 1988).

The Lieutenant Governor serves as the President of the Senate. The Speaker of the House of Representatives is selected by the caucus of the majority party in the House. Legislators are assigned to committees by the parties' leadership, with committee chairs being members of the majority party. When legislation is introduced in either house, the Speaker of the House or President of the Senate sends it immediately to an appropriate committee for debate and review. Legislative committees hold public hearings on the bills, and may amend them or draft substitute bills. Bills must be accepted by both houses in order to go to the governor to be signed. The governor's signature makes the bill a law (LWV 1988).

The Washington State Constitution gives voters two direct legislative powers--the initiative and the referendum. An initiative allows anyone to place a proposed law on the ballot, with a required amount of signatures of registered voters. A referendum empowers the voters to reject laws enacted by the legislature, in most circumstances. A referendum bill is placed on the ballot by legislative action, while a referendum measure is placed on the ballot by petitions signed by citizens (LWV 1988).

PART V. ENVIRONMENTAL REGULATION AND PROTECTION IN WASHINGTON

In some cases, apparent distinctions in the ways that pollution control policies are designed or enforced in British Columbia and Washington may be due to different regulatory ideologies between the U.S. and Canada. In the U.S., environmental legislation gives regulating agencies less discretion than the Canadian regulatory agencies have, and U.S. private groups and individuals are much more apt to use the court system to enforce the law (Lipset 1990). Canadian regulation, on the other hand, tends to "trust the public service to use its expert judgement to protect legitimate interests" (Lipset 1990). At any rate, comprehensive environmental laws in the U.S. determine the roles and actions of environmental agencies, at both the state and national level. Part V of this report summarizes the major state and national environmental laws and government agencies that exist in Washington.

A. MAJOR FEDERAL ENVIRONMENTAL LEGISLATION AND INITIATIVES

In the U.S. national environmental laws abound. Some such laws have become quite complex and all encompassing, such as the Clean Air Act and the Clean Water Act. In many cases, the federal laws outline national requirements or standards, and rely upon the states for implementation. The most significant piece of national legislation concerning water quality is the Clean Water Act of 1972 and its subsequent amendments, which, along with the National Environmental Policy Act, will be discussed below. Other important national laws that directly impact water quality include:

- Marine Mammal Protection Act (1972);
- Wild and Scenic Rivers Act (1968);
- National Fishing Enhancement Act (1984);
- Deepwater Port Act (1974);
- Coastal Zone Management Act (1972);
- Marine Protection, Research, and Sanctuaries Act (1972);
- Safe Drinking Water Act (1974);

The Clean Water Act and Amendments:

The Clean Water Act is the most comprehensive national legislation protecting water quality in the United States. The Act has been amended several times since it was passed in 1972, the most extensive amendments creating what is known as the Water Quality Act of 1987. The Clean Water Act directs the Environmental Protection Agency (EPA) to regulate industrial and municipal discharges of conventional, toxic, and certain nonconventional pollutants (Jessup 1990).

To comply with this direction, the EPA establishes uniform guidelines across SOME industrial sources, known as technology-based standards. These standards delineate the quantities of pollutants allowable in effluent, based upon the technological and economical capacity of specific industries to reduce certain pollutants. The Act also requires the states to establish (and review every three years) receiving water quality standards which include the use-classification of a body of water and the water quality criteria that must be met to support the use. These standards, along with EPA's effluent guidelines, establish discharge limits that apply to individual wastewater sources.

The Act and its amendments encompass a number of programs including:

- the National Pollutant Discharge Elimination System (NPDES), requiring all industrial, municipal, and government sources that discharge effluent to comply with discharge permits;
- Section 404, which gives the Army Corps of Engineers jurisdiction over the discharge of dredge and fill materials in all waters of the U.S., and provides a basis for wetlands protection at the federal level;
- federal support to state revolving loan funds through which local governments can borrow money for waste water treatment facility construction and improvements;
- permits for industrial stormwater discharge permits and city storm sewer systems;
- strong requirements concerning the control of toxic pollutants; and
- the Environmental Protection Agency's National Estuary Program (Jessup 1990).

Many of these programs will be discussed further in Part VII of this report.

National Environmental Policy Act:

The National Environmental Policy Act (NEPA) "declares that each person has a right to a healthful environment, and that it is in part the responsibility of the Federal Government to ensure that the environment is protected" (Orloff 1978)). It "establishes the Council on Environmental Quality (CEQ), a small agency in the Executive Office of the President, whose head is the President's advisor on the environment" (Orloff 1978). NEPA also establishes the environmental impact statement (EIS) process, whereby each federal agency is required to include a description of the adverse environmental impacts of a proposed action. The impact statement process is described further in Part IX.

B. U.S. ENVIRONMENTAL AGENCIES

Due to NEPA requirements, all federal agencies must formally consider the environmental impacts of their activities. The following section describes those federal departments and agencies most involved in the design, implementation, and enforcement of environmental regulations.

Council on Environmental Quality (CEQ):

This Council is headed by three members appointed by the U.S. President, and serves to advise the President on environmental matters. It was created under the National

Environmental Policy Act (NEPA), and its major responsibilities are to gather timely and authoritative information concerning the conditions and trends in the quality of the environment, both current and prospective; to develop and recommend national policies to the President; and to review and appraise the various programs of the federal government to determine with what extent they comply with environmental requirements. The amount of influence that the CEQ wields in the nation's environmental policy debates depends upon the importance that individual Presidents place upon it (Rosenbaum 1985).

U.S. Environmental Protection Agency (EPA):

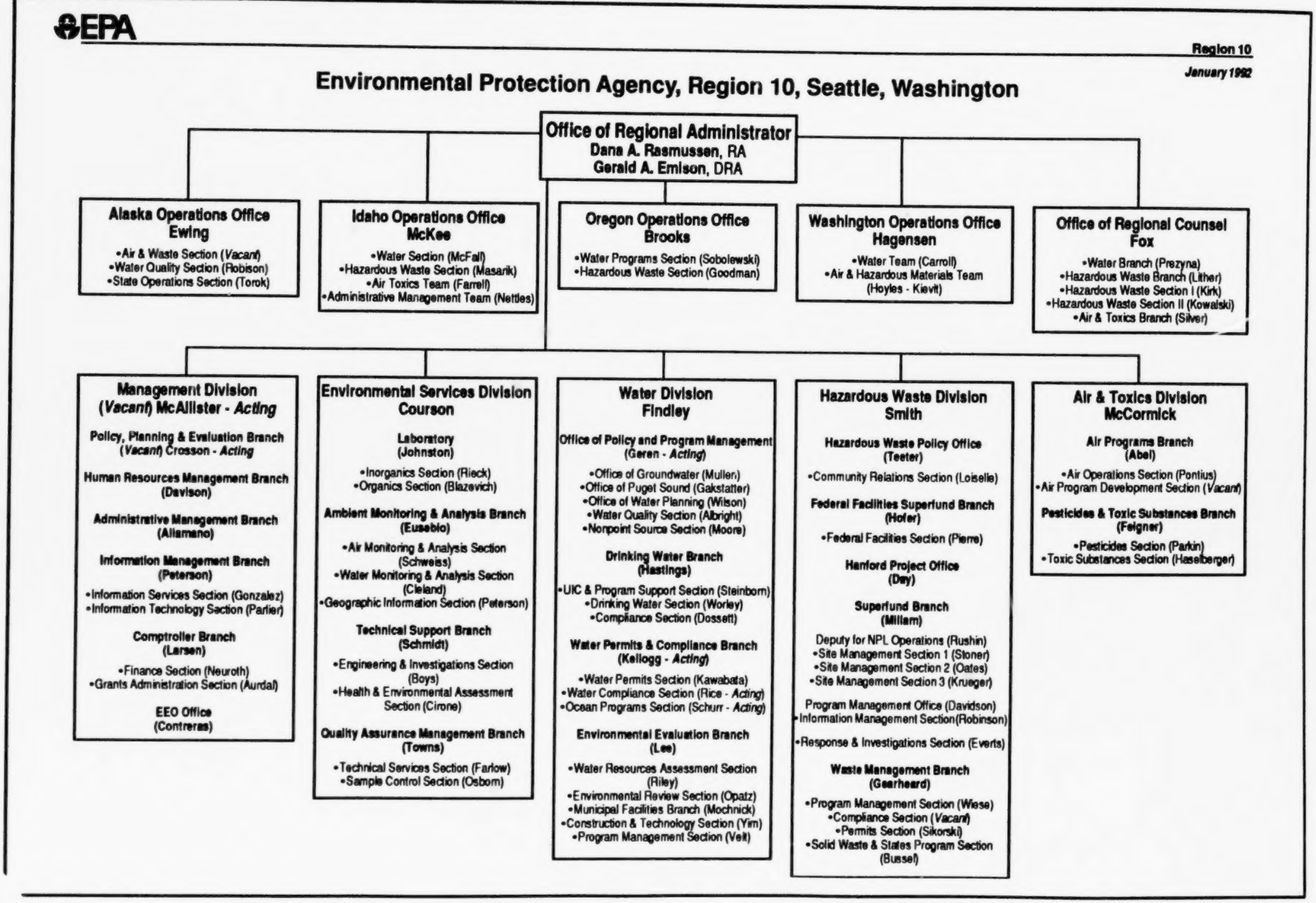
The EPA was created as an independent agency by an Executive Order of President Nixon in 1970. It "endeavors to abate and control pollution systematically...to coordinate and support research and anti-pollution activities by State and local governments...reinforce efforts among other Federal agencies with respect to the impact of their operations...(and) serve as the public's advocate for a livable environment" (EPA 1990). Thus, the EPA is responsible for most of the nation's major environmental programs, including:

- Clean Water Act (1972);
- Safe Drinking Water Act (1974);
- Marine Protection, Research and Sanctuaries Act (1972);
- Toxic Substances Control Act (1976);
- Resource Conservation and Recovery Act (RCRA) (1976);
- Clean Air Act (1970);
- Noise Control Act;
- Federal Insecticide, Fungicide and Rodenticide Act (1982); and the
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (1980).

The Administrator of the Agency is appointed by the President. The EPA consists of a headquarters office in Washington D.C. and ten regional offices. Each regional office is headed by a presidentially appointed Regional Administrator and a career civil servant, the Deputy Regional Administrator. Washington, Oregon, Idaho, and Alaska comprise EPA's Region 10. Operations offices of EPA Region 10 are located in each of the four states (each office has approximately ten people), and the central office (with approximately 700 people) is located in Seattle. The Region 10 office implements policy directives that stem from the headquarters office in Washington, D.C. In some instances, federal programs are managed by state environmental protection agencies, with the EPA providing oversight, as well as technical and financial assistance. In these cases, the EPA's state operations offices provide direct assistance to the relevant state agencies.

The Region 10 office is separated into divisions according to area of responsibility (Figure 8). The Management Division encompasses personnel, administration, and planning and policy development. The other four divisions are described below:

Figure 8:
Organization of the U.S. Environmental Protection Agency, Region 10


EPA
Region 10
January 1992
Environmental Protection Agency, Region 10, Seattle, Washington
Office of Regional Administrator
Dana A. Rasmussen, RA
Gerald A. Emison, DRA
Alaska Operations Office
Ewing
•Air & Waste Section (Vacant)
•Water Quality Section (Robison)
•State Operations Section (Torok)
Idaho Operations Office
McKee
•Water Section (McFall)
•Hazardous Waste Section (Masarik)
•Air Toxics Team (Farrell)
•Administrative Management Team (Nettles)
Oregon Operations Office
Brooks
•Water Programs Section (Sobolewski)
•Hazardous Waste Section (Goodman)
Washington Operations Office
Hagensen
•Water Team (Carroll)
•Air & Hazardous Materials Team
(Hoyles - Kievit)
Office of Regional Counsel
Fox
•Water Branch (Prezyna)
•Hazardous Waste Branch (Lither)
•Hazardous Waste Section I (Kirk)
•Hazardous Waste Section II (Kowalski)
•Air & Toxics Branch (Silver)
Management Division
(Vacant) McAllister - Acting
Policy, Planning & Evaluation Branch
(Vacant) Crosson - Acting
Human Resources Management Branch
(Davison)
Administrative Management Branch
(Allamano)
Information Management Branch
(Peterson)
•Information Services Section (Gonzalez)
•Information Technology Section (Parlier)
Comptroller Branch
(Larsen)
•Finance Section (Neuroth)
•Grants Administration Section (Aurdal)
EEO Office
(Contreras)
Environmental Services Division
Courson
Laboratory
(Johnston)
•Inorganics Section (Rieck)
•Organics Section (Blazevich)
Ambient Monitoring & Analysis Branch
(Eusebio)
•Air Monitoring & Analysis Section
(Schweiss)
•Water Monitoring & Analysis Section
(Cleland)
•Geographic Information Section (Peterson)
Technical Support Branch
(Schmidt)
•Engineering & Investigations Section
(Boys)
•Health & Environmental Assessment
Section (Cirone)
Quality Assurance Management Branch
(Towns)
•Technical Services Section (Farlow)
•Sample Control Section (Osborn)
Water Division
Findley
Office of Policy and Program Management
(Geren - Acting)
•Office of Groundwater (Muller)
•Office of Puget Sound (Gakstatter)
•Office of Water Planning (Wilson)
•Water Quality Section (Albright)
•Nonpoint Source Section (Moore)
Drinking Water Branch
(Hastings)
•UIC & Program Support Section (Steinborn)
•Drinking Water Section (Worley)
•Compliance Section (Dossett)
Water Permits & Compliance Branch
(Kellogg - Acting)
•Water Permits Section (Kawabata)
•Water Compliance Section (Rice - Acting)
•Ocean Programs Section (Schurr - Acting)
Environmental Evaluation Branch
(Lee)
•Water Resources Assessment Section
(Riley)
•Environmental Review Section (Opatz)
•Municipal Facilities Branch (Mochnick)
•Construction & Technology Section (Yim)
•Program Management Section (Veit)
Hazardous Waste Division
Smith
Hazardous Waste Policy Office
(Teeter)
•Community Relations Section (Loiselle)
Federal Facilities Superfund Branch
(Hofer)
•Federal Facilities Section (Pierre)
Hanford Project Office
(Day)
Superfund Branch
(Millam)
Deputy for NPL Operations (Rushin)
•Site Management Section 1 (Stoner)
•Site Management Section 2 (Oates)
•Site Management Section 3 (Krueger)
Program Management Office (Davidson)
•Information Management Section(Robinson)
•Response & Investigations Section (Everts)
Waste Management Branch
(Gearheard)
•Program Management Section (Wiese)
•Compliance Section (Vacant)
•Permits Section (Sikorski)
•Solid Waste & States Program Section
(Bussel)
Air & Toxics Division
McCormick
Air Programs Branch
(Abel)
•Air Operations Section (Pontius)
•Air Program Development Section (Vacant)
Pesticides & Toxic Substances Branch
(Feigner)
•Pesticides Section (Parkin)
•Toxic Substances Section (Haselberger)

1. The Water Division manages and directs the development, coordination, implementation and evaluation of the federal drinking water, ground-water protection, water pollution control, and underground storage and leaking tank programs. The Division contains five major sub-groups:

1a. Office of the Deputy Director (formerly the Office of Policy and Program Management) is responsible for federal initiatives regarding Puget Sound and other coastal waters, as well as for groundwater, nonpoint source pollution controls, and water planning.

1b. Drinking Water Programs Branch monitors compliance with federal drinking water laws and controls underground injections of fluids.

1c. Water Permits and Compliance Branch manages the National Pollutant Discharge Elimination System (NPDES), and ensures permit compliance.

1d. Municipal Facilities Branch manages and directs the administration of the municipal construction grants and the state revolving fund programs established in the Clean Water Act.

1e. Environmental Evaluation Branch prepares environmental assessments and environmental impact statements on EPA's NPDES new source permits and construction grant programs. The branch also administers EPA's ocean dumping program and implements the Section 404 enforcement program for dredge and fill material.

2. The Air and Toxics Division consists of the Air Programs Branch and the Pesticides and Toxic Substances Branch, and manages and directs Agency efforts for abatement, control, permitting, and/or compliance in the air, toxic substances, pesticides and radiation programs.

3. The Environmental Services Division contains the Ambient Monitoring and Analysis Branch, the Technical Support Branch, and the Laboratory.

4. The Hazardous Waste Division deals with problems and issues that cut across Superfund and the Resource Conservation and Recovery Act. Responsibilities include solid and hazardous waste management, regional hazardous waste policy development, technical and financial assistance through grants to federal, state, and local agencies, and technical assistance to industry.

Other Federal Environmental Agencies:

Other federal government agencies and departments include programs dedicated to resource conservation and protection. The following federal agencies also play significant roles in environmental protection and water quality management.

U.S. Department of the Interior "has responsibility for most of the nationally-owned public lands and natural and cultural resources." This responsibility includes the management of federally owned land and water resources, fish and wildlife, national parks and historical places, outdoor recreation areas, and energy and mineral resources. The Department also "has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. Administration" (USFWS 1991). The Secretary of the Interior is appointed by the President of the United States and serves on the President's Cabinet.

The most significant environmental branches of the Interior Department for Washington state are summarized below. Some of the Department of the Interior's functions are similar to those carried out by Environment Canada and the B.C. Ministry of Environment, Lands and Parks.

The National Park Service develops and implements park management plans and staffs Washington's three national parks and several of its national recreation areas.

The U.S. Fish and Wildlife Service is "the principal agency through which the federal government carries out its responsibilities to conserve, protect, and enhance the nation's fish and wildlife and their habitat... The Service's major responsibilities are for migratory birds, endangered species, certain marine mammals, and freshwater and anadromous fish" (USFWS 1991).

The U.S. Geological Survey "classifies and manages mineral and water resources on federal lands...conducts and sponsors research in areas including mapping, geography, mineral and land resources, water resources, rangeland, wildlife and environmental monitoring" (Rosenbaum 1985).

The Bureau of Reclamation is a major actor in the eastern half of the state. The Bureau manages, develops, and protects water quality and quantity and related resources, particularly with regard to irrigation.

Department of Agriculture is part of the Executive Branch of U.S. Government. The Assistant Secretary for Natural Resources and Environment, typically a political appointee with a natural resources background, is responsible for administering the policies of the Forest Service and the Soil Conservation Service.

The U.S. Forest Service manages commercial and protected national forests in Washington and throughout the U.S. The Forest Service is responsible for ensuring compliance with the state's water quality standards and Forest Practices Act by writing Best Management Practices into forest contract permits. National Forest Management Plans outline future management strategies for each forest, and must undergo federal environmental review.

The Soil Conservation Service was established in 1935 to "carry out a continuing program of soil and water conservation on private lands" (PSWQA 1986b). The Service's priorities are to reduce soil erosion, improve irrigation water management, reduce upstream flooding, improve water quality, improve forest and range management. It provides "technical assistance to private individuals, community and watershed groups, and public agencies through a federal-local partnership with Conservation districts," of which there are 48 in Washington state (PSWQA 1986b).

National Oceanic and Atmospheric Administration (NOAA), under the U.S. Department of Commerce, "gathers data, conducts research, and makes predictions about the environment..." (NOAA 1989). The Western Regional Center, in Seattle, Washington, houses many regional NOAA offices relevant to water quality protection. In addition to the services and branches listed below, other technical and scientific offices exist in the Western Regional Center.

The northwest office of the National Marine Fisheries Service establishes sound fishery management practices and supports and conducts fisheries research. It is also responsible for conserving marine mammals and protected species, including whales, porpoises, seals, and sea turtles.

The Hazardous Material Response Branch provides technical assistance to the U.S. Coast Guard and other agencies in responding to oil spills and other spills in the marine environment.

The National Ocean Service is the federal government's oldest scientific and technical organization. In the Western Regional Office it operates and maintains a fleet of research vessels and collects and analyzes marine hydrographic data. In addition, the Service provides data atlases of coastal regions, tide predictions, and nautical charts. The National Geodetic Reference System, within the National Ocean Service, provides a precise geographic framework for oceanographic and aeronautic mapping and charting. The Sanctuaries and Reserves Division, also within the NOS, researches the feasibility of nationally designated marine protected areas, and, once established, manages them. The Service's Status and Trends monitoring program is located in Washington, D.C.

United States Coast Guard (USCG), under the Department of Transportation, investigates, monitors, and/or supervises the clean-up of pollution or hazardous chemical spills to the navigable waters of the U.S.

U.S. Army Corps of Engineers, under the Department of Defense, "regulates all construction projects in the navigable waters of the U.S. and promulgates regulations governing the transportation and dumping of dredged materials in navigable waters..." (Rosenbaum 1985). The Corps plays a significant role in regulating dredging activities, managing ocean dumping, and wetlands protection.

C. MAJOR STATE ENVIRONMENTAL LEGISLATION AND INITIATIVES

Major state environmental policies and programs stem from national laws which require the states to comply with certain requirements and regulations. Some of the more significant legislation is summarized below.

State Water Pollution Control Act:

This Act "provides the principal statutory authority for the State's water quality program." This includes authority to administer the programs of the Federal Clean Water Act and the establishment of an anti-degradation policy reflected in the state water quality standards (Ecology 1989).

State Environmental Policy Act (SEPA):

SEPA requires "all state and local government agencies to review the environmental effects of all governmental actions, such as permits, which are not categorically exempt as determined by guidelines issued by the Department of Ecology" (PSWQA 1986b). As with the National Environmental Policy Act (NEPA), an environmental impact statement may be required for some projects and actions. If unacceptable adverse impacts cannot be mitigated, a project proposal may be denied by Ecology. The environmental review process is discussed in greater detail in Part IX of this report.

Shoreline Management Act:

The Shoreline Management Act of 1971 established both a planning process and a permit process for the state's shorelines. This process requires substantial development permits (for projects costing over $2500) to comply with local shoreline plans, and applies to all water areas of the state and their associated wetlands except for lakes less than 20 acres in size and stream segments upstream of a point where mean annual flow is 20 cubic feet per second or less (PSWQA 1986b). This state legislation complies with the requirements of the federal Coastal Zone Management Act of 1972.

The Puget Sound Water Quality Management Act:

In 1985, the Washington State Legislature created the Puget Sound Water Quality Authority as "a single entity with adequate resources to develop a comprehensive plan for water quality protection in Puget Sound to be implemented by existing state and local governments" (RCW 90.70.001). The principle responsibility of the Authority is to develop, adopt, and oversee the implementation of the Puget Sound Water Quality Management Plan (discussed in Part VII, Estuary Management Programs). State agencies and local governments evaluate and incorporate applicable provisions of the plan into their policies and activities. The Authority was originally meant to revise the plan every two years and was to terminate in 1991, but recent amendments to the authorizing legislation called for an extension of the Authority until 1995 and for a four-year plan update cycle following the adoption of the 1991 plan.

Washington Environment 2010:

This 1990 document identifies the major environmental challenges facing the State of Washington and makes a number of recommendations for addressing those challenges. It was developed by a public advisory committee and a steering committee comprised of the directors of the state and federal environmental and resource management agencies in Washington. It is meant to focus attention on specific issues rather than serve as a "detailed blueprint for policy." Two of the top priority items listed by the document are point and nonpoint source discharges to water. Key recommendations regarding water quality include the following:

- develop local plans to protect whole watersheds from the effects of nonpoint source pollution;
- monitor on-site sewage systems and upgrade inadequate systems;
- explore use of economic incentives and disincentives to promote the use of better land management practices;
- establish local stormwater management programs;
- improve upon the wastewater discharge permits system, increase permit fees and make fees correspond to volume and toxicity of discharges;
- promote manufacture and use of unbleached paper;
- develop groundwater protection program; and
- develop a comprehensive statewide wetlands protection and management plan.

Other legislation promulgated by the Washington legislature and relevant to protecting water quality include the Washington Forest Practices Act, the Aquatic Lands Act, and the Water Resources Act.

D. STATE ENVIRONMENTAL REGULATORY AGENCIES

The following government entities play significant roles in protecting Washington state's environment and natural resources.

Department of Ecology:

When the Department of Ecology (Ecology) was established in 1970, the legislature proclaimed that "it is a fundamental and inalienable right of the people of Washington to live in a healthful and pleasant environment and to benefit from the proper development of its natural resources." The Department of Ecology is Washington's chief environmental regulatory agency, comparable in many respects to British Columbia's Ministry of the Environment, Lands and Parks.

The governor appoints the Director and the seven-member Ecological Commission, which advises the Director, and has limited approval authority over the department's regulations (LWV 1988). Ecology administers the state laws for pollution control, such as the State Environmental Policy Act, the Water Pollution Control Act, and the Shoreline Management Act, and implements a variety of federal laws.

Ecology has four regional offices: the Northwest Regional Office (in Redmond), the Southwest Regional Office (in Tumwater), the Eastern Regional Office (in Spokane), and the Central Regional Office (in Yakima). Each regional office has primary responsibility for permitting, compliance monitoring, and enforcement of the state's environmental quality as well as many resource management laws. Each region has its own priorities, programmatic emphases, and corresponding technical capabilities (Ecology 1991).

The Department of Ecology is divided into three major program areas: Central Programs and Enforcement, Water and Shorelands, and Waste Management (Figure 9). The major functions of these three programs are summarized below.

1. The Office of Water and Shorelands addresses water quality and quantity issues and consists of four major programs.

1a. Shorelands and Coastal Zone Management administers the state Shoreline Management Act of 1971 and the federal Coastal Zone Management Act of 1972. Within this program activities relate to floodplain management, wetlands, and the Padilla Bay National Estuarine Research Reserve, and shellfish bed protection, among others.

1b. Water Quality Financial Assistance distributes water quality and pollution prevention grants and loans to public organizations. The program also helps with design, planning, and the construction of projects.

1c. Water Quality contains the Point Source Management Section which issues waste water discharge permits under the National Pollutant Discharge Elimination System, and assigns fees for dischargers. Other sections include the Nonpoint Source Management, Basin Planning and Standards, and Administration and Information Management.

1d. Water Resources regulates water allocation, monitors water uses in accordance with established rights, and promotes conservation.

2. Central Programs and Enforcement contains three major programs. The Central Programs Section of this program addresses oil spills, enforcement activities, and state environmental reviews (as administered under the State Environmental Policy Act). The Environmental Investigations and Laboratory Services Program is the technical and investigative arm of Ecology. It primarily analyzes environmental samples, investigates contamination problems, and carries out inspections of discharges. The Air Programs Section writes industrial air emissions permits and works to reduce air pollution.

3. Waste Management contains five major sections. These sections are Toxics Cleanup; Nuclear and Mixed Waste Management; Waste Reduction, Recycling, and Litter Control; Waste Management Grants; and Solid and Hazardous Waste.

Other State Agencies:

Department of Fisheries "preserves, protect, perpetuate, manage, and enhance the food fish and shellfish resources of Washington" (PSWQA 1990). The department works with the Department of Wildlife to enforce the Hydraulics Code (See Part VII, Wetlands Protection) and is responsible for other fisheries laws.

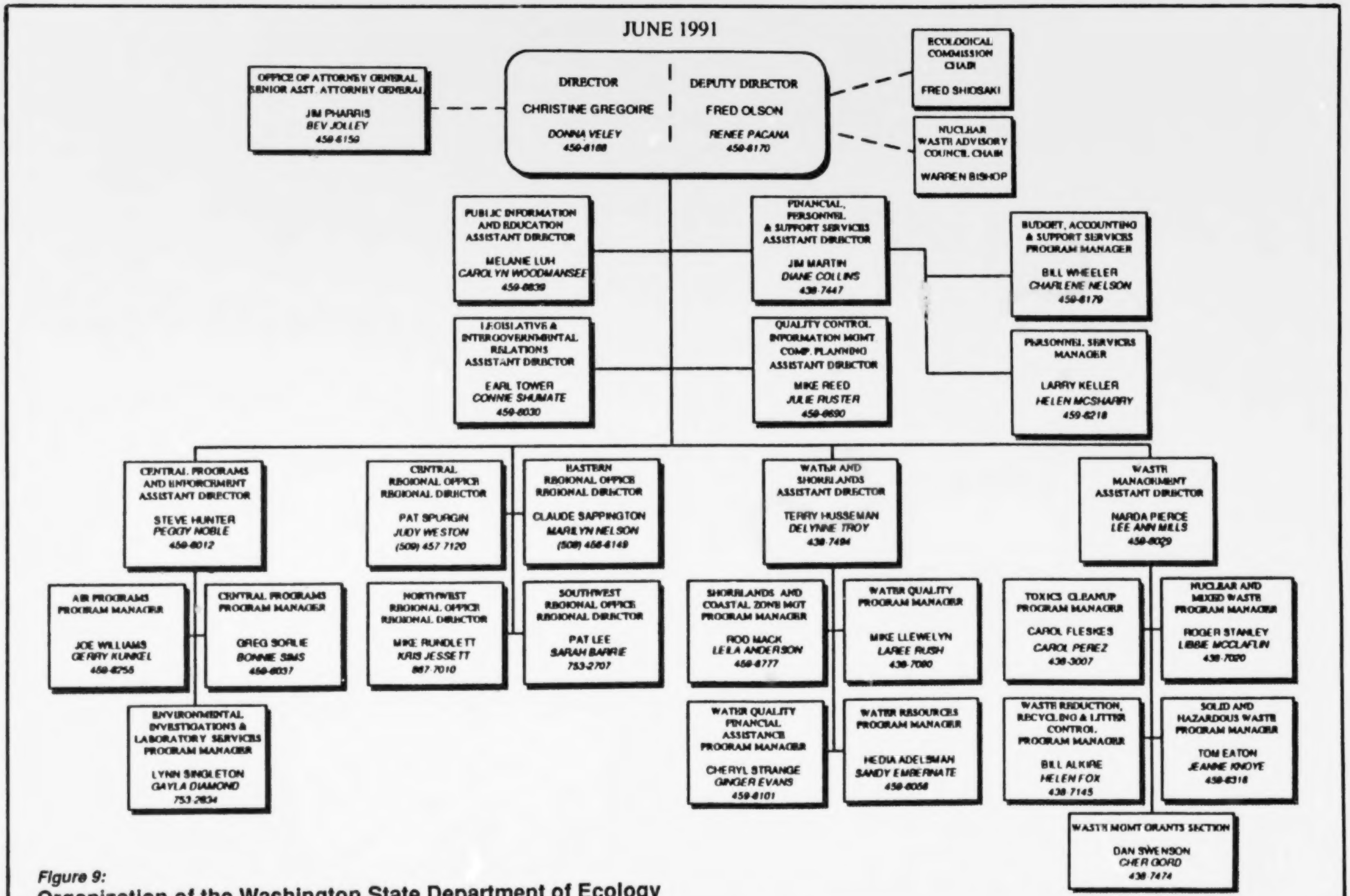

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Figure 9:
Organization of the Washington State Department of Ecology

Department of Wildlife protects and manages "all birds, mammals, and game fish along with all those marine, estuarine, freshwater, and terrestrial species not classified for human consumption" (PSWQA 1990). The department protects fish and wildlife habitat through the Hydraulics Code, and manages a number of wildlife protection programs.

State Parks and Recreation Commission has seven members appointed by the Governor. A professional staff acquires, develops, maintains, and operates the state parks system (LWV 1988). The Commission also administers the Scenic Rivers Act, which encourages management plans to protect special features of the designated rivers (PSWQA 1990).

Department of Natural Resources (DNR) manages five million acres of forest, agricultural, urban and aquatic lands. It enforces laws regulating logging practices, reforestation requirements, petroleum and natural gas exploration and surface mine reclamation. It also manages state Natural Area Preserves and state Natural Resources Conservation Areas, and runs the Natural Heritage program (which identifies and locates rare and endangered species throughout the state). The DNR administers all state-owned aquatic lands to benefit residents of Washington, and leases the lands for shellfish harvesting, mineral development, aquaculture, and waterfront construction (DNR 1991). The state owns the beds of all navigable lakes and rivers, the bed of all marine waters within three miles of shore, and all the beds of Puget Sound.

Department of Health monitors shellfish beds in Washington's coastal waters and works with Ecology to regulate, protect and restore recreational shellfish beds in Puget Sound. This is accomplished through the Shellfish Office of its Environmental Health Programs. DOH also administers regulations concerning on-site sewage treatment systems, and provides technical, planning, and educational assistance to local health officials. The Department is also responsible for monitoring drinking water and upholding drinking water quality standards.

Department of Agriculture helps control nonpoint source pollution by defining and regulating pesticide usage and coordinating with the Department of Ecology to eliminate accumulation of unused pesticides (Ecology 1989). The Department is also responsible for regulating the application of herbicides, pesticides, or therapeutic compounds to aquaculture, giving it a direct role in water quality management. It is the Department of Ecology, rather than Agriculture, that has primary responsibility for managing nonpoint source pollution from agricultural lands.

Washington State Conservation Commission provides training, guidance and assistance to the state's 48 conservation districts, which work one-on-one with local governments and landowners to promote soil conservation practices. The Commission plays a key role in developing and implementing nonpoint source pollution management plans (Ecology 1989).

Puget Sound Water Quality Authority develops and updates the Puget Sound Water Quality Management Plan, a comprehensive plan for water quality protection in Puget

Sound. This plan is to be implemented by existing state and local government agencies. Its purpose is to restore and protect the water quality and biological health and diversity of Puget Sound (PSWQA 1990). The eleven authority members include the Director of the Department of Ecology, the Commissioner of Public Lands (or their appointees) and nine gubernatorial appointments.

Treaty Indian Tribes are major players in state discussions of water quality, quantity and habitat issues. This role stems in part from the treaty rights of western Washington tribes and the Yakima tribe to take half of the fish resources, and the implication that this entitles tribes to prevent degradation of fish habitat. This claim has been partially supported by federal court, which ruled that the habitat issues must be resolved on a case-by-case basis. Some tribes within Washington also have jurisdiction over water quality on their reservations, playing the role of the state regarding implementation of federal laws.

Port Districts provide facilities for all forms of terminals (air, land, water); capital improvements for industrial and manufacturing activities; waterways through dredging, filling, and bulkheading; waste disposal, sewers and other utilities not provided by other government entities; and comprehensive plans for the district. Each of the 75 port districts in Washington is governed by a three-person elected board of commissioners (except Seattle and Tacoma which have five). Members serve six-year staggered terms. Ports may play a role in water quality issues through their involvement in land-use planning, dredging, nonpoint source pollution, and effluent discharge from vessels (LWV 1988).

VI. BRIEF COMPARISON OF U.S. AND CANADIAN GOVERNMENTAL SYSTEMS

One of the key distinctions between the two governmental systems lies with the U.S. concept of division of powers. Unlike the U.S. government, Canadian Cabinet ministers at the head of the government comprise both its executive and legislative branches. Party loyalty in Canada, on matters of substance, is expected, and thus the party in power tightly controls federal authority in a manner unknown in the U.S. In Canada, the federal government "speaks with one voice" (Carroll 1979). This is not true in the United States, where the party controlling the executive branch does not always control the legislative branch, and conflict constantly arises between the U.S. President (and Cabinet) and the Congress (Carroll 1979). This basic difference in governmental systems results in a Canadian legislative process that is "much more expeditious and direct than that in the U.S" (Lucas 1977). Furthermore, because elected officials serve as the head of Canadian government agencies, the Canadian bureaucracy serves as an extension of a single party in power more so than does the politically-checked U.S. bureaucracy (Lucas 1977).

The Canadian parliamentary system offers fewer pressure points for the public or interest groups to affect legislation than does the U.S. system (Carroll 1989). In the state of Washington, citizens elect state and national representatives at different intervals for varying numbers of years. With the Parliamentary system, voters in British Columbia vote for one national representative to the House of Commons and one provincial representative to the Legislative Assembly. While an initiative or referenda process to reform government decisions such as exists in Washington is not present in British Columbia, provincial elected officials (MLA's) can be dismissed between elections by public referenda. For the most part, however, if a Canadian interest group is dissatisfied with a government program, it often must wait until major elections to attempt to influence a course of action (PSWQA 1988).

While Canadian voters may be given fewer chances to formally express their opinions through the polls or initiative process, the possibility of a vote of no-confidence helps to keep the government in line with public opinion. In the United States, once an official is elected, that person typically remains in office until their term expires, regardless of popular opinion. In contrast with Canada, when the American chief executive is elected, his or her tenure in office is in no way dependent on the fate of the legislative program (Jackson 1990). When the government changes in Canada, the mechanism for reversing policies and laws is more powerful than that which exists during a change in the executive or legislative branches in the U.S. This is due to the power of the majority party in the legislative and executive branches of Canadian government. In British Columbia it is also more common for the government to reorganize and restructure its Ministries (whether while assuming leadership or during leadership) than it is for the Washington Governor or Legislature to reorganize.

Unlike the United States, interest group lobbying in Canada is least effective when the policy concerned is already before the federal or provincial legislative bodies. This is because, for the most part, policies are already formed before they reach Parliament or the Legislative Assembly. Thus, much lobbying in Canada occurs at the Cabinet level (recall, however, that Cabinet members are also members of the legislative body) and within the higher levels of the agencies (Jackson 1990). This contrasts starkly with the intense lobbying of legislators that occurs in the U.S., where legislators from both parties are equally responsible for policy making.

Although both the U.S. and Canada have federal governments, characterized by a division of power between one central national government and many regional governments, the powers accorded to the two levels of government differ between nations. With respect to environmental protection, constitutional interpretation by some Canadian courts has given the provinces jurisdiction over the natural resources within their boundaries, as well as authority to regulate most types of pollution. In the United States, ownership of resources is more evenly divided among state, national, and private interests, and the federal government has the power to put forth broad legislation concerned with environmental protection.

Thus, it seems that the parliamentary system is more expeditious and responsive to change than is the U.S. system of checks and balances, yet it may also be more resistant to public opinion at the legislative level. Bureaucrats in British Columbia have greater authority to initiate major policy reviews than do those in Washington. Other major differences, specific to natural resource management, lie in the balance of power between the state or province and the federal government. In British Columbia, the province has much more independent authority over issues of environmental protection than does the state government in Washington, although the relationship between the province and the federal government is undergoing constant evolution driven by court decisions and new legislation. Finally, it has been observed by some officials that in Canada, water quality protection has traditionally been driven by fisheries protection, while in the U.S., human health or general environmental protection has been more the focus.

A basic understanding of these major distinctions between the Canadian and U.S. government systems helps build a foundation for understanding the differences between the ways that environmental quality is regulated in British Columbia and Washington. Part VII of this report will discuss these more issue-specific differences.

PART VII. ISSUES IN ENVIRONMENTAL MANAGEMENT

This part of Beyond the Border serves to introduce the reader to the ways that different aspects of environmental management are currently approached in British Columbia and Washington. Each section describes legislation and government agencies relevant to a specific issue, and provides names of people whom the reader can contact for more information. While some comparisons between processes in the two different jurisdictions are made, the following sections mainly describe the significant policies and programs that affect each aspect of environmental management and do not provide an analysis of the relative efficiency of these policies in protecting the environment. Issues covered include:

- Point Source Pollution Control;
    - Pulp and Paper Effluent;
    - Mining and Smelting Effluent;
    - Municipal Sewage Effluent;
- Nonpoint Source Pollution Control;
- Pleasure Craft Discharges;
- Oil Spill Response
- Dredging Regulations;
- Ocean Dumping/ Dredged Materials Disposal;
- Wetlands Protection;
- Estuary Management Programs;
- Marine Protected Areas;

The topics listed above were chosen due to their current or potential significance to transboundary surface water pollution management. Because it was not possible to cover all issues relevant to water quality, the exclusion of some topics, such as agriculture, shipping wastes, or the regulation of the petroleum industry, should not be construed a sign of their relative importance or unimportance.

Each section in this part begins with a brief summary of the approaches that Washington and British Columbia take in managing that topic, and may include significant definitions or explanatory notes. In most cases, the relevancy of the topic to water quality or transboundary pollution is discussed. Each section is then divided into a more detailed discussion of how the topic is addressed in British Columbia, and how it is approached in Washington. The reader should keep in mind that the policies and programs in each country may evolve and change with time, and that this report addresses the current approaches taken in each nation.

Distinctions between the ways in which British Columbia and Washington manage the environment may be due to different population densities (in 1990, B.C. had less than four people per square kilometer, while Washington had about twenty-eight people per square kilometer), dependencies upon different resource industries, different rates of industrial growth, or different regulatory and enforcement ideologies. Whatever the reasons, differences as well as similarities exist between environmental programs in

Washington and British Columbia. The following sections outline some of these differences and similarities.

A. POINT SOURCE POLLUTION CONTROL

According to the U.S. Clean Water Act, point sources are those facilities with discrete pipes, ditches, or outfalls that discharge effluent or wastewater. Point sources include publicly owned sewage treatment plants (also called municipal dischargers) and industrial or commercial facilities (industrial dischargers) (PSWQA 1986a).

Point source pollution is regulated in both B.C. and Washington through permit systems, but the ideologies behind the requirements contained in the permits are somewhat different. Although Canadian federal regulations pursuant to the Fisheries Act are mandatory, the general approach of both Environment Canada and B.C. Environment, Lands and Parks, is to adopt standards and guidelines to prevent pollution, many of which are not considered as mandatory regulations. The provincial Ministry issues permits to discharge sources, with particular conditions imposed in the permits that are to conform as far as practicable to the standards and guidelines. The terms of the licenses are legally enforceable, but at times the agency and the applicant may negotiate some of the requirements contained in the permit (Carroll 1989). Consideration may be given to the economic health of the firm, the stability of the community in which it is located, or the quality of the water body in which the firm will discharge. In most cases where the standards or guidelines are not strictly met, the permit will contain a schedule for attaining the target level.

While U.S. water quality standards consider water body uses in their design and effluent standards consider technological feasibility, once these standards are developed they are legally binding regardless of a firm's economic health or location. The premise of the Clean Water Act is that all pollution is undesirable and should be reduced to the minimum that technology will permit. The concept of negotiation on a case-by-case basis is not integral to environmental law in the U.S., as it appears in some cases in Canada (Carroll 1989).

In the following discussion, general approaches to controlling point source pollution are detailed. Because pulp and paper mills, municipal dischargers, and mining operations are sources currently involved in controversies between Washington and British Columbia, regulations specific to these three types of dischargers are examined in detail. It is recognized, however, that other major industrial categories of point source polluters may also create the potential for transboundary conflicts.

CANADA/B.C. POINT SOURCE POLLUTION CONTROL

Under the Canadian Constitution, the provinces own the natural resources exclusive of federal lands and waters. Notwithstanding this, the federal government has the authority to regulate discharges which may affect fisheries, migratory birds, transboundary waters, or which originate from shipping or other transportation modes. B.C. Environment, Lands and Parks is chiefly responsible for water quality permitting and compliance monitoring and the Ministry incorporates most of the federal regulations in its requirements.

Federal Control:

The Fisheries Act is one of the most major pieces of pollution control legislation in Canada. This Act prohibits the discharge or deposition of any material which may be deleterious to fish, or into fish habitat or where it may enter such waters including spawning grounds, nursery, rearing, food supply and migration areas or upon which fish depend directly or indirectly. Under the Fisheries Act, several federal regulations regarding effluent discharges have been promulgated, the most significant of which relate to the pulp and paper and mining industries (to be discussed later in this report). In the past, federal enforcement of the Fisheries Act provided the key element of water quality protection in British Columbia, and because of the Act's significance, water quality protection in British Columbia has been directed chiefly at sensitive fisheries areas.

In addition to the Fisheries Act, other federal laws enable the Canadian government to become involved in point source pollution control. The Canada Water Act "authorizes Environment Canada to regulate and administer waste effluent disposal in areas of federal jurisdiction, and to formulate joint standards with provincial governments where there is significant national interest" (Day 1990). Under CEPA, the federal government also has authority to control toxic substances.

As a policy, the pollution control elements of Environment Canada's programs are implemented through the provinces. For example, the Provinces include federal requirements in their waste discharge permits and licenses. In a one-window approach to permit review, applications for permits are referred by the Ministry to relevant provincial agencies and to Environment Canada if the proposed project involves federal jurisdiction. Environment Canada refers the applications to its various services, and to Fisheries and Oceans if a threat to fish or fish habitat is present (Harding 1987).

Environment Canada's Environmental Protection section usually provides comments on permit applications and has the authority to enforce the general provisions of the Fisheries Act if a permitted effluent or an unauthorized discharge is considered to be deleterious to fish, fish habitat, spawning grounds, or areas used for nursery, rearing, food supply and migration.

In some instances, a discharge permitted by the province may violate these provisions. For example, not all provincial permits stipulate a non-acutely lethal discharge. Furthermore, provincial water quality objectives do not apply within an initial mixing dilution zone, and water quality in the discharge area may have toxic or sublethal effects on aquatic life. In other cases, water quality objectives for contaminants may not exist and thus, even though harmful, certain pollutants may not be managed or regulated under provincial objectives and permits (Day 1990). Environment Canada may determine whether discharges are harmful through a bioassay of trout or salmon in the effluent to be discharged, and may choose to enforce the federal law, tightening effluent requirements.

Provincial Control:

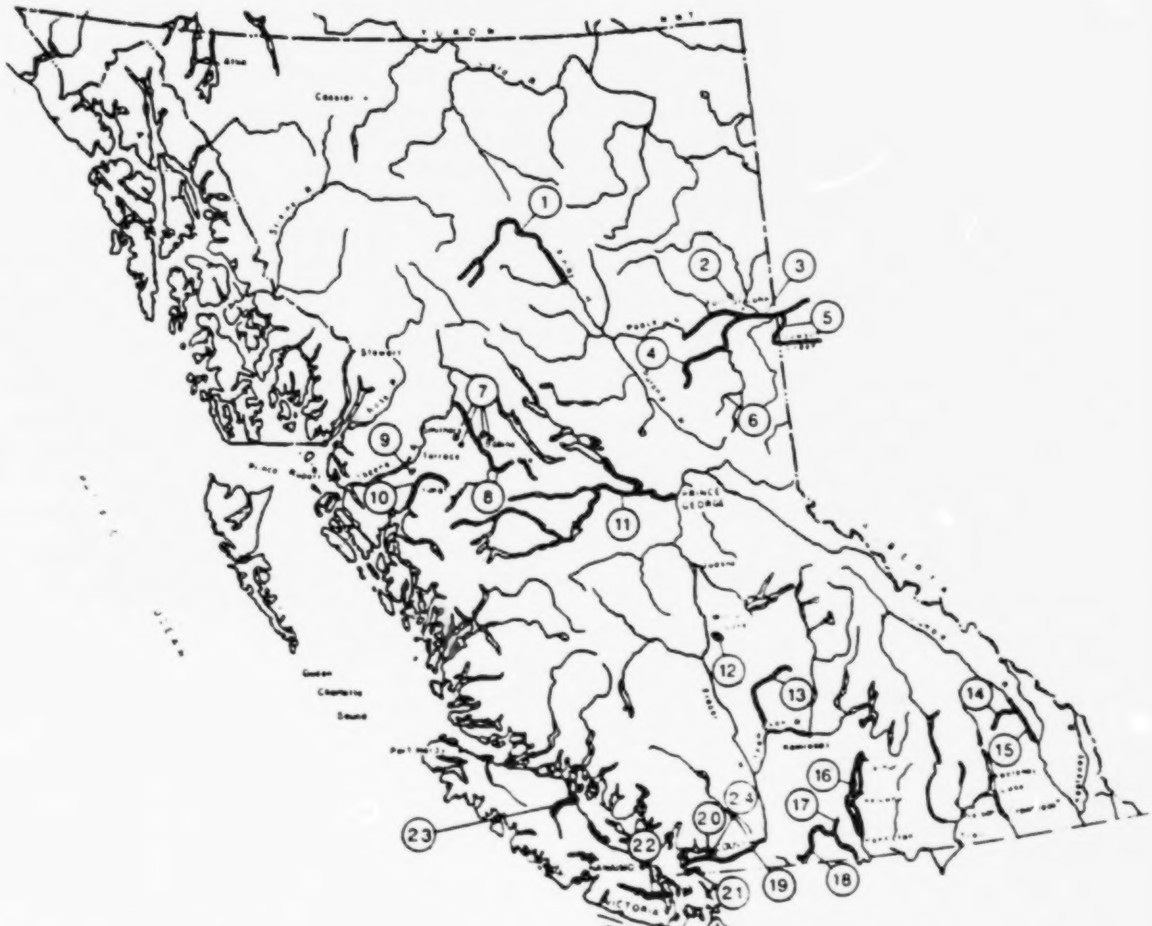
The Environmental Protection Division of B.C. Environment, Lands and Parks regulates waste discharges through Waste Management Permits, which specify the quantity and quality of waste allowed to be released. These permits are legally enforceable, and are based upon the desired environmental quality of the media (air, land, water) into which the waste will be discharged. The required treatment also reflects the Best Practicable Technology as spelled out in the province's Pollution Control Objectives, a series of industry-specific guidelines designed to protect environmental quality. However, if a submitted permit application does not meet the objectives, the application is evaluated and compliance terms may be negotiated with the discharger. In this manner, environmental protection can be tailored to the technological capabilities of the discharger and the economic needs of the province.

The provincial Pollution Control Objectives were introduced during the 1970's and provide a range of possible waste discharge concentrations according to the environmental quality desired for a discharge area. Generally, new facilities are expected to meet the highest standards, and existing facilities are given interim requirements while working on upgrades to the higher standard. Although they are not enforceable, the objectives provide the major means for evaluating permit applications, and exist for five categories of waste dischargers:

- municipal type waste discharges;
- mining, smelting and related industries;
- forest products industry;
- chemical and petroleum industries; and
- food-processing, agriculturally orientated, and other miscellaneous industries.

The Ministry has recently begun to review these industry-based objectives. The province is also working to develop site-specific water quality objectives. These objectives have been set in 24 bodies of water believed to be the most likely to :be affected by man's activity, now and in the foreseeable future" (B.C. Env. 1986). Those bodies of water for which water quality objectives have been set are shown in Figure 10. Each of the 24 site-specific water quality objectives describes the level of contaminants that can be present in the water basin while maintaining water quality for the basin's most sensitive use. In those water bodies where objectives exist, the newly designed water quality objectives could result in permits being issued with control parameters which supersede the effluent standards contained within the five sets of Pollution Control Objectives.

Figure 10:
Bodies of Water For Which Water Quality Objectives Have Been Set
(from B.C. Environment, 1990)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Cassiar
Stewart
Terrace
Prince Rupert
Prince George
Queen Charlotte Sound
Port Hardy
Victoria

1. Upper Finlay R.
2. Charlie L.
3. Peace R.
4. Pine R.
5. Pouce Coupe R.
6. Bullmoose Cr.
7. Kathlyn, Seymour, Round, and Tyhee L's.
8. Bulkley R.
9. Lakelse L.
10. Lower Kitimat R. and Arm
11. Nechako R.
12. Williams L.
13. Bonaparte R.
14. Toby Cr.
15. Columbia and Windermere L.
16. Okanagan Valley L.
17. Cahill Cr.
18. Similkameen R.
19. Lower Fraser R.
20. Lower Fraser R.
21. Boundary Bay
22. Cowichan - Koksilah R.
23. Quinsam R.
24. Lower Fraser R. tributaries

The province bases its more recently derived water quality objectives upon water quality criteria. Criteria represent minimum and/or maximum values which must not be exceeded to prevent detrimental effects from occurring to a water use under specified environmental conditions. For example, the Ministry of Environment, Lands and Parks recommends that water for irrigation contain less than .5 mg of boron per liter, while drinking water may contain up to 5 mg of boron (Pommen 1991). For those biological, chemical, and physical properties for which B.C. Environment, Lands and Parks has not formally approved a criteria, the Ministry generally refers to a set of Canadian Water Quality Guidelines developed by the Canadian Council of Ministers of the Environment. The provincially and federally derived criteria may or may not be adhered to in the creation of site-specific water quality objectives, depending upon the characteristics of the water body and the likelihood of meeting those criteria (Ministry of Environment and Parks 1986).

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U.S./WASHINGTON POINT SOURCE CONTROL

In Washington State, point source pollution is regulated through the Department of Ecology's implementation of the federal Clean Water Act and state Water Pollution Control Act. Under the federal legislation, the states may adopt water quality standards and criteria that are as stringent or more stringent than those of the Environmental Protection Agency.

Federal Control:

In 1972, the federal Clean Water Act set a goal that the nation's waters be "fishable and swimmable" by 1983, and created a permit system for effluent discharges. Standards for these permits were to be designed by the Environmental Protection Agency (EPA) and implemented by the states (PSWQAa 1986).

The Clean Water Act also instructed the EPA to establish effluent guidelines for industries that were major polluters, based on economic and technological feasibility. To date, EPA has technology-based standards for over 52 industrial categories. All new sources of pollution in these categories should meet the effluent limits, but pre-existing sources were given schedules to meet these technology-based effluent standards. Technology-based standards do not mandate a specific type of control system, but are based on the demonstrated performance of the appropriate technology (PSWQA 1986a).

Three types of technology based standards exist in the U.S. Best Practicable Control Technology Currently Available (BPT) was required to be installed by all industries by July 1977. In determining BPT, the EPA considered "the total cost of application of technology in relation to the effluent reduction, benefits to be achieved..., the age of the equipment and facilities involved, the process employed, the engineering aspects of...various types of control techniques, process changes, non-water quality environmental impact and such other factors as deemed appropriate (EPA 1989). Best Conventional Pollutant Control Technology (BCT) applies to conventional pollutants (BOD, TSS, pH, temperature) and are similar to BPT but require a more stringent cost-benefit analysis. Best Available Technology Economically Achievable (BAT) is required for control of toxic and some nonconventional pollutants, with limited economic criteria.

In the state of Washington, the EPA maintained the authority to issue federal water quality permits for federal facilities and those point sources on Indian lands that discharge to surface waters (Ecology issues wastewater permits to point sources on Indian fee lands that discharge to groundwater). The EPA also monitors state-issued permits for a pre-selected list of major dischargers in Washington. These "major permits" are agreed to by Ecology and EPA and include larger municipalities, major industries, and dischargers on sensitive water bodies.

Stormwater has recently been brought under NPDES rules, and the state Department of Ecology, which administers the NPDES program, is currently in the process of developing a state implementation program for stormwater control.

State Control:

The EPA may delegate authority to administer certain provisions of the Clean Water Act to the states. In Washington, the Department of Ecology (Ecology) administers the National Pollution Discharge Elimination System (NPDES) permit program created by the Clean Water Act. According to the Act, all point source discharges of pollutants are illegal unless specifically addressed in a permit. The Department of Ecology also regulates industrial discharges into sewer systems via state authority and the federally mandated pretreatment program (PSWQA 1986a). In addition to managing the federal surface water discharge programs, Ecology administers a state permit program for groundwater and surface application dischargers.

The Clean Water Act requires the states to develop and adopt ambient receiving water quality standards which can not be violated by dischargers. These receiving water quality standards incorporate water body classifications and water quality criteria, and must be reviewed every three years. To construct the water quality standards, the states must first classify individual water bodies according to designated uses. For example, in Washington, Class AA bodies of water are the most pristine and can be used for water supply, swimming, and fishing (among other uses). The state must then adopt water quality criteria--numerical concentrations of contaminants that will preserve or achieve each classification. In some cases, the state bases its ambient water quality criteria upon those published by the EPA in its Water Quality Criteria Documents. Whether they do this or develop their own criteria, the state's criteria must be at least as protective as those developed by the EPA. The Department of Ecology has numerical ambient water quality criteria for 22 toxicants and six conventional pollutant parameters (fecal coliform bacteria, dissolved oxygen, total dissolved gas, temperature, pH, and turbidity), and has recently established sediment quality standards for marine sediments.

In addition to adopting water quality standards, the Department of Ecology has also developed technology-based requirements. These requirements are known as All Known Available and Reasonable Treatment technologies (AKART), which are at least as stringent as those technology-based standards promoted by the EPA, and in some cases encompass pollutants or industries for which the EPA has not yet developed Best Available Technology (BAT) standards. For some industries neither the EPA nor Ecology have yet specified technological standards. In those cases effluent limits for discharge permits are developed on a case-by-case basis. Technology-based effluent limits must not cause violations of receiving water quality criteria. In most cases, technology-based effluent limits are more stringent than those necessary to meet water quality criteria, but in some cases (as in the case where the amount of dilution is small) effluent limits are based on water quality standards and may be more stringent than technology-based limits.

A discharge permit establishes limits on quantity and concentration of some pollutants, and specifies requirements for actions such as monitoring or spill prevention. NPDES permits require compliance with water quality and technology-based standards. The Clean Water Act states that toxics may not be discharged in toxic amounts, and the state addresses this concern through its standards and the terms of its permits. Each discharger monitors its own effluent according to permit requirements, and reports compliance with its permit to the Department of Ecology. Both the EPA and Ecology are authorized to inspect dischargers periodically and to take enforcement actions if a permit is being violated. NPDES permits expire and must be renewed every five years. The Department of Ecology (or the EPA in the case of federal facilities and indian lands) makes draft permits available for public comment.

As in British Columbia, Washington's water quality standards do not apply inside an authorized dilution zone surrounding a wastewater discharge. However, the state will not issue permits for discharges which cause mortalities of fish or shellfish within the zone or which diminish aesthetic values (PSWQA 1986a).

The Department of Ecology recently developed sediment management standards, making Washington the first state in the nation to have sediment-based criteria included in its NPDES permits.

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A.1. POINT SOURCE, PULP AND PAPER EFFLUENT CONTROL

Discharges from the pulp and paper industry are regulated in the same manner as other point source effluent discharges in B.C. and Washington. However, pulp mill effluent regulations are highlighted in this report due to transboundary interest in how pollution from the industry is managed.

In both British Columbia and Washington, pulp and paper manufacturers are a vital part of the economy, yet produce waste that in many cases is toxic. In British Columbia, six (of ten) coastal mills currently discharge untreated or partially untreated effluent into marine waters. Other mills discharge treated effluent into the Fraser, Columbia, and Peace rivers. Recently, dioxins found in fish in Washington's Lake Roosevelt were traced to untreated discharges from Celgar, a pulp and paper mill across the border on the Columbia River. In Washington, one mill discharges treated effluent into the Pend Oreille River (which traverses the Canadian border), while eight others are located along the shores of Puget Sound, potentially contributing to transboundary pollution in the region's shared coastal marine waters. Other Washington mills discharge to the Columbia and areas such as Grays Harbor.

Both nations are making efforts to reduce toxic discharges from this industry, specifically focusing on dioxins and AOX. In British Columbia, new provincial regulations are mill specific, and based upon concentrations present in the effluent. Federal regulations under the Fisheries Act and Canadian Environmental Protection Act have also been proposed. New regulations in Washington are based upon concentrations present in the receiving waters, and are currently being appealed by the industry.

CANADA/B.C. POINT SOURCE, PULP AND PAPER EFFLUENT CONTROL

Both provincial and federal governments play a role in regulating discharges from the pulp and paper industry. British Columbia regulates the industry's discharges through effluent and air emission permits under the Waste Management Act. These permits can be site specific, but are generally based upon the province's Pollution Control Objectives for The Forest Products Industry. Some conditions of these permits are overridden by the standards set in the province's newly written Pulp Mill and Pulp and Paper Mill Liquid Effluent Control Regulations. The Federal government also has regulations for pulp and paper mill effluent, which the provincial permits and requirements typically include.

Federal Regulations:

With amendments to the Fisheries Act in 1970, Environment Canada received specific authority to develop regulations for industrial wastes. Because pulp and paper effluents equaled half of the industrial waste discharged into Canadian waters, the industry was singled out as the first to be brought under the new federal regulatory process. The national discharge regulations were developed by a task force comprised of provincial, federal, and industrial representatives. This task force established standards in the form of numerical values for BOD (biological oxygen demand), TSS (total suspended solids), and toxicity (Sinclair 1990).

According to the national regulations, new mills built after 1971 would comply with the effluent standards. Mills undergoing alteration or expansion after 1971 would negotiate compliance requirements with the province and federal government. Those mills in existence before 1971 would be gradually brought into compliance with the standards, but no time limit was formally established. Regulations were to be applied according to available technology and the financial situations of individual mills (Sinclair 1990). Revisions to these national pulp and paper effluent limitations have been designed to include the application of federal regulations to all mills, not simply the new ones. These revisions have been announced and should be proclaimed in 1992.

Fisheries and Oceans Canada and Environment Canada have the authority to enforce the federal regulations and to execute the conditions of the Fisheries Act that prohibit the discharge of substances harmful to marine life. Because provincial permits and regulations typically include the federal requirements, B.C. Environment, Lands and Parks is chiefly responsible for enforcing the pulp and paper effluent regulations and permits in the province.

The 1988 Canadian Environmental Protection Act (CEPA) delegates authority to the federal government for the control of toxic substances. Under CEPA, Environment Canada is currently developing regulations for chlorinated dioxins and furans in pulp and paper mill effluent as well as regulations regarding the life-cycle of pulp and paper mill defoamer containing dibenzofuran or dibenzo-para-dioxin and pulp and paper mill woodchips containing polychlorinated phenols. Like the new regulations under the Fisheries Act, these regulations under CEPA are expected to be finalized by June 1992.

The federal government is also currently proposing an administrative agreement whereby it would jointly administer pollution control regulations for pulp mills with the Province.

Provincial Regulations:

The current federal regulations represent national standards (known as best practicable technology, BPT) for TSS, BOD_5, fish toxicity levels that each province in Canada is expected to incorporate within its pulp and paper effluent permits. In British Columbia, the Pollution Control Objectives specific to the forest products industry reflect a broader spectrum of pollutants and other requirements than do the federal regulations, and represent the Ministry policy upon which the effluent permits are based. As with the federal regulations, the objectives are currently being revised.

The provincial Pulp Mill and Pulp and Paper Mill Liquid Effluent Control Regulations, which came into force in December of 1990, establish new requirements which supersede permit requirements for Total Suspended Solids (TSS), BOD_5 and toxicity. In addition to these more stringent requirements, the new regulations also set AOX (chlorinated organics, including dioxins) standards and monitoring requirements. To achieve compliance with these regulations, all pulp mills are required to install secondary treatment works. New controls on effluent discharges will help achieve the standard of 2.5 kilograms of chlorinated organic compounds (AOX) per metric tonne of discharge by 1993, with further reductions to 1.5 kilograms by 1995, and an ultimate objective of zero discharge by 2002.

The regulations name each pulp and paper mill in the province and specify dates by which each mill must meet the AOX requirements, complete construction of secondary treatment works, and comply with effluent quality standards. All mills are subject to the same standards, but the date by which they must come into compliance varies among the mills according to their technological and economic capacity to conform to the new standards. For example, the province's older mills, located mostly along the coast, have not previously been subject to federal regulations and thus have not had secondary treatment facilities in place. Some of these mills have been allowed more time to comply with provincial regulations, with no date set later than 1994. One mill at Port Alberni must meet a special effluent control regulation because of the sensitive environment into which it discharges.

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U.S./WASHINGTON PULP AND PAPER EFFLUENT CONTROL

Seventeen pulp and paper mills exist in Washington state, eight of which discharge into the waters of Puget Sound, and one of which is located on the Pend Oreille River, about thirty miles south of the Canadian border. Effluent discharges from Washington's pulp and paper industry are regulated under the federal Clean Water Act and the state Water Pollution Control laws, the requirements of which are implemented by the state's Department of Ecology through discharge permits.

Federal Role:

Under the Clean Water Act, pulp and paper manufacturers are among the more than fifty industries required to comply with the U.S. Environmental Protection Agency's best available technology (BAT) effluent standards for toxic pollutants. Of the 129 toxic pollutants on the Clean Water Act's Toxics list, two (tri-chlor-phenol and penta-chloro-phenol) are discharged in substantial amounts by the pulp and paper industry. These two toxics are the only two regulated under the Best Available Technology requirements for pulp and paper. Both old and new mills are expected to comply with the same BAT. The EPA is currently revising all parameters for toxic and conventional pollutants for the pulp and paper industry.

State NPDES permits must also comply with the EPA's Best Conventional Technology for conventional pollutants (BOD, TSS, and pH) as well as the state's water quality standards (which are modeled after EPA guidelines).

State Role:

The state is responsible for issuing effluent discharge permits to pulp and paper mills, in accordance with both federal and state discharge regulations.

In addition to the EPA's technology-based limitations on pollutant discharges under the Clean Water Act, the states must adopt water quality criteria that are acceptable to the EPA. Washington's Department of Ecology adopted the EPA's recommended water quality criteria for dioxins, from which effluent limits were developed and incorporated into discharge permits for the pulp and paper industry. Moreover, based upon the state's All-Known Available and Reasonable Treatment (AKART) standards, Ecology recently put AOX (Adsorbable Organic Halides) requirements into the effluent discharge permits of pulp and paper mills. These AKART and dioxin requirements are currently being appealed by the dischargers.

In its permits, Ecology requires pulp and paper mills to monitor certain pollutants of interest, and some mills have been asked to perform twelve to fifteen month ambient monitoring studies to determine the effects of discharged materials on aquatic life. Mills have also been asked specifically to monitor their effluent for dioxins and AOX, and must develop strategies to minimize the amount of dioxins and AOX discharged while they develop the technology required to meet the new dioxin standards.

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A.2. MINING AND SMELTING EFFLUENT CONTROL

Mining operations exist along the international border between Washington and British Columbia, and may be of transboundary concern where waters flow between the jurisdictions. One smelter in British Columbia currently discharges into the Columbia River, creating concern for public officials and citizens in Washington's downstream Lake Roosevelt. Because of the current interest in smelting regulations, and the potential for conflict over mining operations, this type of point source discharge is specifically addressed below.

Effluent discharges from mining operations in Washington are more stringently regulated than those found in British Columbia. In some cases, coastal mines in British Columbia have discharged tailings (50% water, 50% spent ore material) directly into the marine environment (Env. Can. 1991). Provincial permits issued under the Waste Management Act regulate discharges from smelters, while the federal government protects water quality through enforcement of the Fisheries Act. No smelters exist in Washington, but some of the ore mined in the state is processed by the large, multi-national company in British Columbia.

CANADA/B.C. MINING AND SMELTING EFFLUENT CONTROL

Like pulp and paper mills, effluent discharges from mining operations in British Columbia are regulated by both the provincial and federal governments. Federal regulations designed for the mining industry could be enforced through the provincial permitting system, but Environment Canada and Fisheries and Oceans Canada are responsible for overall enforcement of federal requirements.

Federal Role:

In 1977, through its authority under the Fisheries Act, Fisheries and Environment Canada (now Environment Canada and the Department of Fisheries and Oceans) promulgated national standards for specific mining waste products in the Metal Mining Liquid Effluent Regulations and Guidelines. These regulations and guidelines are administered by Environment Canada and list minimum pH standards as well as maximum authorized average concentrations for the most common mining pollutants: arsenic, copper, lead, nickel, zinc, total suspended matter, and radium 226. These regulations and guidelines are incorporated in the province's effluent discharge permits, and outline the maximum levels of pollutants that the Department of Fisheries and Oceans and Environment Canada have deemed meet the requirements of the Fisheries Act.

The regulations apply to all overland flow of water from mines, including effluent discharges, tailings pond overflows, and surface drainage. New, expanded, or reopened metal mines throughout Canada are subject to these requirements (excluding gold mines practicing cyanidization), but they serve only as guidelines for mines existing as of 1977. The regulations also address effluent from those few smelters, pelletizing plants, sintering plants, refineries, acid plants and similar operations that are directly affiliated with the mining operation. Operations such as cyanidization gold mines, placer mines, smelters unaffiliated with specific mines, and all others not included in these Effluent Regulations and Guidelines are regulated under the general provisions of the Fisheries Act.

Environment Canada and Fisheries and Oceans Canada are authorized to enforce the general provisions of the Fisheries Act, which prevent the deposition of deleterious substances in waters or habitat used by fish. In most cases, however, the federal government will confer with the Province before it takes enforcement action, in order to determine which agency should proceed with the action.

Provincial Role:

The province addresses mining and smelting waste issues through its Waste Management Permits, which may incorporate the provincial Pollution Control Objectives for the

Mining, Smelting, and Related Industries of British Columbia. These objectives outline possible ranges of pollutant concentrations (unlike the U.S. regulations which specify a maximum for any one day and a maximum thirty day average). The Pollution Control Objectives contain receiving water quality objectives for some parameters (dissolved oxygen, toxicity, alkalinity, chloride, temperature, turbidity, floatable solids, aesthetics, and fecal coliform) and objectives for the discharge of final effluent for other parameters (TSS, TDS, toxicity, pH, radioactivity, and specific elements and compounds).

The provincial objectives encompass more pollutants than do the federal regulations, and also differ from Environment Canada's regulations in that the parameters are measured by dissolved metals rather than by total metals (dissolved plus particulate metals). The province has attempted to address this inconsistency by incorporating both types of measurements in mine permit monitoring requirements, and sometimes incorporating total metals as permit criteria.

Provincial permits do not necessarily reflect the federal regulations or guidelines, nor do they necessarily reflect Pollution Control Objectives, the terms of the permits are negotiated on a case-by-case basis. Permit violations are enforced by B.C. Environment, Lands and Parks' Regional Operations and Enforcement Department. Violations of the federal regulations or the Fisheries Act can be investigated by Environment Canada or Fisheries and Oceans Canada, but provincial enforcement agencies may and often do file charges under the federal legislation.

In British Columbia, proposed coal and hard-rock mineral mining operations are subject to a special development review process, which will be discussed in the environmental review section of this report.

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U.S./WASHINGTON MINING EFFLUENT CONTROL

Mining operations in Washington are predominantly for gold and lead-zinc ores. Effluent discharge is mostly regulated through state waste discharge permits. Although there are no smelting operations in the state, milling operations (where the ore is readied for smelting) are regulated by both state and federal requirements.

Federal Regulations:

Under the Clean Water Act, the Environmental Protection Agency promulgated technology-based standards for the mining industry. Type of pollutant regulated and the maximum concentrations allowable differ among types of materials mined, but the same technology-based standards apply to gold, copper, lead, zinc, silver, and molybdenum. Standards represent maximum one day concentrations and thirty day maximum average concentrations for certain pollutants. For gold, copper, lead, zinc, silver, and molybdenum, different standards apply to mine drainage (tailings overflows, surface runoff) than apply to process water (point discharge).

In addition to the technology-based standards, dischargers must also comply with the state's water quality standards, some of which are based upon criteria designed by the EPA. In all cases, the most stringent of the regulations, whether promulgated by the EPA or the state, apply to the discharger.

For milling operations, federal regulations do not allow metallic mineral processing pollutants to be discharged to surface water. The wastes from this process must be placed in lined tailings impoundment, and the long-term management of the impoundments must be addressed in the Department of Ecology's reclamation requirements (discussed below).

State Regulations:

Most new state-issued permits for mining operations do not allow discharge of effluent into surface waters, but rather, first require mine waste recycling systems and then require evaporation (in synthetic membrane mine ponds). These operations that no longer discharge into surface waters are not part of the NPDES program but instead receive state waste discharge permits. Some mines still operate under NPDES permits, but this type of discharge is being phased out. Those NPDES permits that exist take into account the state's water quality criteria and all discharges to surface water are based upon the state's all Available Known and Reasonable Treatment technology (AKART) for mining operations, which are more stringent than the federal best available technology for the industry.

In addition to permitting waste discharge, the Department of Ecology also issues permits or authorizes mining activities concerned with any use or diversion of water and for mining operations within flood zones. The agency also assesses the chemical composition of muds produced by mining operations (Ecology 1989).

The Washington State Department of Natural Resources (DNR) issues permits to surface mining operations under the state's Surface Mining Act. State regulations "focus on reclamation (of open pits, drainage ditches, etc.) to prevent any sedimentation or other water pollution and require that reclamation take place simultaneously with mining." The mine operator's permit application must include a reclamation plan and a plan for containing sediments and contaminants during active mining. Where discharge of wastes is considered, the operation also needs a waste discharge permit from Ecology. Local DNR employees help enforce the state's surface mining regulations. Some sections of the Surface Mining Act applicable to coal mining are superseded by federal regulations (Ecology 1989).

The Departments of Fisheries and Wildlife require Hydraulic Project Approval (a "hydraulics" permit) for operations where dredging, panning, or sluicing occurs within the high-water mark of waterbodies. This hydraulic project review and permit conditions are designed to ensure the project will not harm fish or fish habitat (Ecology 1989).

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A.3. POINT SOURCE, MUNICIPAL SEWAGE EFFLUENT CONTROL

In Washington, municipal sewage discharges are regulated by the federal Clean Water Act which is enforced by the state's Department of Ecology. The regulations include an effluent discharge permit system based upon best available technology. The law requires all municipal sewage facilities to achieve the equivalent of secondary treatment or better. Waivers to the requirements of this law are allowed in some states for coastal municipal dischargers, no exceptions exist in Washington. In those water bodies where dischargers threaten water quality standards (see above point source discussion for explanation of standards), municipal facilities may be required to achieve tertiary or advanced secondary treatment.

In British Columbia, the general provisions of the Fisheries Act provide the only means of federal regulation of municipal sewage facilities. Effluent discharges are permitted by B.C. Environment, Lands and Parks under the Waste Management Act. Where site-specific water quality objectives exist (see above point source discussion for explanation of objectives), restrictions on discharges may be more stringent than in other water bodies.

Because of its significance as a transboundary issue, and because it is regulated a bit differently than other types of point source pollution, municipal sewage control is specifically addressed in this section of this report.

CANADA/B.C. POINT SOURCE, MUNICIPAL SEWAGE EFFLUENT CONTROL

In British Columbia, the province regulates and issues permits for municipal waste dischargers using the Province's Pollution Control Objectives for Municipal type Waste Discharge as guidelines. The federal government plays a role in regulating municipal sewage, related to its interest in fisheries.

Federal Role:

The Canadian federal government comments on the proposed permit (or liquid waste management plan for larger communities) before it is approved by the Province. The federal review involves an assessment by both the Department of Fisheries and Oceans and the Department of Environment which is coordinated by Environmental Protection of Environment Canada, under the auspices of the Fisheries Act. In some cases, the requirements of the Fisheries Act may be more stringent than those set out in the Province's pollution control objectives, and Environment Canada may recommend that effluent discharges be more thoroughly treated. The federal government does not assist in the funding of municipal sewage treatment plants.

Provincial Role:

The Regional Offices of the Environmental Protection Division of B.C. Environment, Lands and Parks issue discharge permits for sewage treatment plants. Permits may be approved on an individual basis, or the Ministry may approve a Liquid Waste Management Plan for multiple dischargers in a regional district or municipality. The Greater Vancouver Regional District has recently developed a Liquid Waste Management Plan, which was approved by the Ministry of Environment, Lands and Parks. This plan sets out the most environmentally acceptable, yet affordable, ways to collect and dispose of the region's liquid waste. The Capital Regional District (Victoria) is also in the process of designing a Liquid Waste Management Plan. These plans are developed by advisory committees comprised of representatives from government agencies, industry, and public interest groups, and involve extensive public comment.

Permits and Liquid Waste Management Plans address or adhere to the Pollution Control Objectives for Municipal Type Waste Discharges in British Columbia. These objectives call for secondary treatment for municipal discharges to fresh water, estuaries, and embayed marine waters. Where adequate flushing is documented in embayed areas, primary treatment with extended marine outfalls may be allowed. Municipal discharges to open marine waters must, at a minimum, have primary treatment unless long extended outfalls are used. Where a facility uses extended marine outfalls, comminution (grinding into small particles) or screening is required as a minimum level of treatment. With extended marine outfalls, the permit applicant must monitor receiving water quality and allocate (or acquire) space to house an appropriate treatment facility in the future. Such extensive receiving water quality monitoring is not required of most other dischargers.

The Pollution Control Objectives serve as guidelines, rather than regulations. Although most of the municipalities in the province comply with the objectives, a few of the smaller, economically unstable communities along the coast may not. Twenty-six inland municipalities use tertiary treatment to meet site-specific water quality objectives (i.e. nutrient removal), while four inland municipal dischargers remain using only primary (the Trail Regional System discharging to the Columbia, Nelson discharging to the Kootenay River, and Lillooet and Lytton discharging to the Fraser River). The other sixty-four plants discharging to freshwater have secondary treatment facilities.

The Greater Vancouver Regional District (GVRD) is in the process of installing two secondary treatment plants (Annacis Island and Lulu Island) which discharge effluent to the Fraser River Estuary. A third plant (Lions Gate) which discharges primary effluent to English Bay is under review. At the fourth plant (Iona Island), which discharges primary effluent through an extended outfall to the Strait of Georgia, an assessment of receiving water impacts is underway. Victoria's Capital Regional District discharges fine screened raw sewage (using 6 mm screens) through extended outfalls to the Strait of Juan de Fuca. Communities discharging to marine waters in the Gulf Islands and to the Strait of Georgia north of Nanaimo are required to have secondary treatment.

Except in the case of Indian Reserves, municipalities do not receive federal funding to meet the Pollution Control Objectives. They may receive funding from the provincial government for up to 50 percent of the costs of a sewage treatment plant or 25 percent of the costs of new or improved sewer systems.

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U.S./WASHINGTON MUNICIPAL SEWAGE EFFLUENT CONTROL

Municipal dischargers are regulated by the state Department of Ecology through permits, as authorized under the federal Clean Water Act. Similar to the technology-based standards to which industrial dischargers must adhere, municipal discharge facilities must meet requirements based on level of treatment (i.e. must meet primary treatment requirements, secondary treatment requirements, etc.) before wastewater can be discharged.

The federal Clean Water Act requires municipal effluent surface water discharges to meet secondary treatment standards. These standards are 30 mg/liter of BOD_5, and 30 mg/liter of Total Suspended Solids (TSS), or 85% removal of the influent concentrations of BOD and TSS, whichever is more stringent. Generally, to meet these standards, municipalities use biological treatment of the effluent resulting from primary treatment. In addition to the removal of at least 85% of the BOD and TSS concentrations, these biological methods also result in the removal of approximately 75% of metals and a variable percentage of other toxics from the wastewater (PSWQAa 1986). Tertiary and advanced treatment remove higher levels of pollutants and nutrients and may be required for municipal discharges to sensitive waters.

Federal Role:

The Environmental Protection Agency monitors the permit compliance of major dischargers in the state of Washington. A list of major dischargers is predetermined by the EPA and Ecology and includes larger municipalities as well as municipalities discharging to sensitive waters. Although the EPA provides compliance oversight for these more significant municipal dischargers, Ecology maintains primary responsibility for their wastewater regulation.

To assist in meeting the Clean Water Act's secondary treatment requirement, state and federal funds have been granted for construction of secondary treatment facilities and upgrades of existing facilities. The amount of funds available from the federal government for these construction grants has been reduced substantially in recent years. Federal monies are received in the form of grants to State Revolving Loan Funds.

State Role:

A municipality that discharges sewage to surface waters requires an NPDES permit from Ecology. Municipalities that discharge effluent above or below the surface of the land (i.e. crop fertilization) must have a state waste discharge permit issued by Ecology. Permits for both types of dischargers must be renewed every five years. Discharge permits for municipalities generally include limits on BOD, suspended solids, pH, and fecal coliform. Discharge limits on toxic substances, and requirements to perform bioassays are gradually being introduced to the municipal discharge permit systems, beginning with the larger dischargers.

In addition to regulating pollutant levels in the effluent, permits may also include monitoring requirements, specify the proper maintenance and operation of facilities, and include conditions for staying within the facility's design capacity. Ecology may also impose industrial pretreatment requirements upon municipalities.

At the time of permit reapplication, Ecology may decide that the body of water into which the effluent is being discharged needs additional protection. In such cases, the discharger may need to achieve higher quality effluent in order to maintain water quality standards for the water body. Additional treatment may include tertiary treatment, nutrient removal, or restrictions on toxics like chlorine, ammonia, or heavy metals. In most cases, effluent discharged to the ground do not have to receive secondary treatment.

Amendments to the Clean Water Act in 1977 enabled municipalities discharging into marine waters to apply for five-year waivers from the secondary treatment requirement. These waivers are rare, and are allowable only if no unacceptable or adverse impacts exist and a monitoring program must be carried out. Due to the Washington state requirement that municipalities install "all known, available, and reasonable treatment," no waivers in Washington were authorized (PSWQAa 1986). Municipal dischargers around Puget Sound are expected to come into compliance with the secondary treatment requirements by early 1994. METRO, the treatment facility for the greater Seattle area, is expected to comply by December 1995.

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B. NONPOINT SOURCE POLLUTION CONTROL

The U.S. Environmental Protection Agency defines nonpoint source pollution as "...pollution...caused by diffuse sources that are not regulated as point sources." The Washington legislature defines it more specifically as "pollution that enters any waters of the state from any dispersed water-based or land-use activities, including, but not limited to, atmospheric deposition, surface water runoff from agricultural lands, urban areas, and forest lands, subsurface or underground sources, and discharges from boats or other marine vessels (Ecology 1989)." In both nations, as point sources of pollution are increasingly controlled, the significance of nonpoint source pollution becomes increasingly evident.

Washington state addresses nonpoint source pollution on a state-wide level in its federally required Nonpoint Source Pollution Control Plan and Program. In both Washington and British Columbia, nonpoint source pollution is managed chiefly through an approach that includes education, financial and technical assistance, and the voluntary efforts of polluters. In Washington state, this approach is backed up with an enforcement program aimed at polluters identified through complaints. In British Columbia, agricultural runoff can be monitored through voluntary industrial peer groups, and most runoff can be regulated by the provincial government under the Waste Management Act and by the federal government under the pollution provisions of the Fisheries Act.

CANADA/B.C. NONPOINT SOURCE POLLUTION CONTROL

Nonpoint source pollution in British Columbia is regulated at all levels of government, under a set of diverse policies which has not been coordinated into one national or provincial management structure. The Environmental Protection Division of B.C. Environment, Lands and Parks can potentially regulate nonpoint source pollution through the provision of the Waste Management Act that prevents "the presence of environmental substances or contaminants that substantially alter or impair the usefulness of the environment," but the Ministry has just begun to apply this provision to nonpoint source management.

Federal Government:

The federal government regulates nonpoint source pollution through the Canadian Shellfish Sanitation Program and through Sections 35 and 36 of the Fisheries Act. The Fisheries Act prohibits the deposit of deleterious substances in any water frequented by fish or in any place where the deleterious substance or its derivation may enter such water. Thus, if a nonpoint source of pollution can be traced and it affects fisheries waters, the violator must make efforts to control the source. This part of the Fisheries Act is managed by Environment Canada.

Shellfish: The federal government also regulates nonpoint source discharges through the Shellfish Sanitation Program. This program identifies safe shellfish areas to permit commercial harvesting for the domestic market and for export to the U.S. Under the program, Environmental Protection of Environment Canada must classify the waters of shellfish beds and must monitor water quality to prove that the waters comply with the requirements of the program. As a part of this assessment process, the federal government identifies nonpoint sources of pollution and seeks to have them mitigated. A new Canadian Shellfish Sanitation Program is currently in final draft form.

Provincial Controls:

Agriculture: The provincial government is taking the lead in controlling nonpoint source pollution from agriculture sources. In conjunction with the Ministry of Environment, Lands and Parks, the Ministry of Agriculture, Fisheries and Food is developing the Agriculture Waste Control Regulation and the Code of Agriculture Practices for Waste Management. These instruments cover nonpoint sources ranging from animal grazing to the composting of agricultural wastes, and apply to all agricultural operations. If an agricultural operator complies with the Code of Agriculture Practices, that operator does not need a permit or formal approval from the Waste Management Branch of B.C. Environment, Lands and Parks. Otherwise, the permit application will go through the regular review process and both the federal and provincial government will set criteria for that activity.

The Ministry of Agriculture, Fisheries and Food is also in the process of writing a set of guidelines to explain to farmers how to operate in compliance with federal and provincial regulations. These guidelines make recommendations concerning the storage and use of agricultural wastes, application and composting of agricultural waste, agricultural emissions, storage and use of wood waste, on-farm disposal of mortalities, feeding areas and access to water, and the use and storage of agriculture products. The guidelines will be commodity-specific and will replace the existing Environmental Guidelines.

The current guidelines are loosely enforced by self-regulating peer groups which exist for each sector of the agriculture industry, (i.e. beef, dairy). These volunteer committees consist of industry members, and give technical advice to agricultural producers that have had a formal complaint filed by neighbors, the government, or other producers. This program, known as the Agricultural Environmental Services Program (AES) is currently being revitalized by the Agricultural Environmental Protection Council (AEPC) and will be given technical support from the B.C. Ministry of Agriculture, Fisheries and Food.

Agricultural producers can receive confidential technical assistance from the Ministry of Agriculture, Fisheries and Food through a Best Agricultural Waste Management Plan or a Best Soil Management Plan. The implementation of these plans makes the farmers eligible for the Agricultural Land Development Assistance Program. Under this program, producers may receive long-term low-interest loans for on-farm capital improvements that will contribute to environmentally sound management practices.

The Municipal Act of 1979 authorized local governments to pass by-laws concerned with agricultural or livestock nuisances, to further restrict nonpoint source pollution.

Forestry: Although currently no regulatory framework exists for managing nonpoint source pollution from forestry practices, a Forest Practices Code encompassing this issue is being developed. The B.C. Ministry of Forests considers Fish and Wildlife Guidelines when assessing timber harvest plans and permits, and sends all harvest applications to B.C. Environment, Lands and Parks and Fisheries and Oceans Canada for review.

Urban: Municipalities are responsible for approving or denying zoning and rezoning of properties, a process during which potential sources of pollution can be identified and mitigated. When the zoning or rezoning application is along a coastal shoreline, Environment Canada becomes involved with the referral process. Stormwater runoff may be addressed by municipalities in their waste management plans, but is not managed by B.C. Environment, Lands and Parks.

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U.S./WASHINGTON NONPOINT SOURCE POLLUTION CONTROLS

In Washington state, agencies at all levels of government from federal to local are involved in many different facets of nonpoint source pollution control, but pollution control generally falls under the jurisdiction of state or local governments. The major federal and state nonpoint source pollution control programs are discussed below.

Federal Efforts:

Section 319 of the 1987 Clean Water Act amendments requires the states to prepare Non-point Source Assessment Reports and develop Management Programs. These reports identify sources of nonpoint pollution, inventory water bodies that can not meet water quality standards without nonpoint source pollution controls, and recommend management practices to control this type of pollution (Marine Law Institute 1991). Indian tribes meeting specific criteria in Section 518 of the Clean Water Act may be treated as states and may develop their own assessment and management programs.

A new federal program that focuses on strengthening the control of nonpoint source pollution in coastal waters is being developed. This program is administered through both the Coastal Zone Management Act and Section 319 of the Clean Water Act, and requires states to coordinate state and local water quality plans, as well as "identify land uses that contribute to coastal water pollution, identify critical coastal areas, implement management measures necessary to maintain applicable water quality standards, and provide technical assistance to local governments" (Marine Law Institute 1991).

The Environmental Protection Agency recently issued a stormwater regulation under the National Pollutant Discharge Elimination System (NPDES). A draft baseline general permit is currently being reviewed, and will be used by the Department of Ecology in drafting a model stormwater discharge permit for the state, to apply to larger municipalities and industries.

State Efforts:

In 1989, the EPA approved Washington State's Nonpoint Source Pollution Assessment and Management Program, which complies with the Clean Water Act's Section 319 requirements. This four-year Nonpoint Source Pollution Control Program draws on existing state, regional, and local plans, and adopted the Puget Sound Water Quality Management Plan as the nonpoint source program for Puget Sound (PSWQA 1990b). Federal funding for the Washington program has chiefly focused on managing agricultural and timber harvest sources of nonpoint source pollution, although the Puget Sound Watersheds are also a priority.

In its Nonpoint Source Pollution Control Program, Washington State relies on cost-effective best management practices (BMPs) to achieve state water quality standards for specific bodies of water. BMPs are defined as "agronomic, managerial, or technical controls applied to site-specific problems" (Ecology 1989). If voluntary implementation of BMPs does not meet this goal, Ecology can require BMP implementation.

The Department of Ecology administers a watershed planning program in the Puget Sound Basin designed to reduce nonpoint sources of pollution and protect beneficial uses of the water. As a part of this program, the 12 counties bordering Puget Sound were required to identify and rank their watersheds in priority order for developing watershed plans. Local watershed management committees are in the process of developing plans for the twelve early action watersheds identified (one in each county), and some implementation of recommendations has begun. Watershed management committees are comprised of affected and interested parties, and are encouraged to develop plans which use education, voluntary actions, financial incentives, and technical assistance, while recognizing the effectiveness of regulation and enforcement on controlling some sources of nonpoint source pollution (Ecology 1990b). Plans for other top-ranked watersheds in each county have also begun to be developed by committees. A handbook for local governments and ranking and management committees outlines regulations for the watershed management program, and was first distributed in 1989.

The 1991 Puget Sound Water Quality Management Plan reconfirms a commitment to the watershed planning process, and it supplements the watershed plans with education and prevention programs. The plan also develops or enhances state programs or regulations for those nonpoint sources that are most effectively controlled at the state level (this specifically includes recreational boaters and on-site septic systems) (PSWQA 1990b). Ecology was designated the lead agency in the Puget Sound Plan's nonpoint source management program, with other federal, state and local agencies, and tribes responsible for technical assistance to local watershed management committees (Ecology 1989).

Agriculture: BMPs for dairy waste, dryland and irrigated agriculture are identified in the state's Water Quality Management Program aimed at surface and groundwater protection. State programs rely on voluntary implementation of BMPs, with enforcement of water quality standards as a last resort (PSWQA 1990b). Conservation districts, the Cooperative Extension Service, and the federal Soil Conservation Service promote farm planning and the use of BMPs by providing technical assistance to farmers and promote farm planning and the use of BMPs. Agricultural BMPs to protect groundwater are currently being developed. Some surface water quality BMPs are currently being reviewed by the Washington Conservation Commission and conservation districts (PSWQA 1990b).

Forestry: Forest practices BMPs are included in Washington's Forest Practices Rules and Regulations. They are referenced in the state's Nonpoint Source Management Program. Some of these BMPs were revised by the Timber Fish and Wildlife Agreement, a process which involved state agencies, tribes, environmentalists, and the forest industry, and include voluntary and regulatory tools. Ecology has also developed memorandums of understanding with the U.S. Forest Service and Bureau of Land Management whereby the agencies agree to meet or exceed state requirements by implementing BMPs and other nonpoint source management strategies (Ecology 1989).

Urban: Combined sewer overflows (CSO's) are now regulated under NPDES program with discharges required to meet all applicable requirements. Stormwater discharge permits will also be required for larger cities (greater than 100,000 people) and industries (PSWQA 1990b). Local governments play a major role in nonpoint source pollution control through land-use planning and the enforcement of health regulations (PSWQA 1986b).

Shellfish: The major thrust of the Department of Ecology's Shellfish Protection Strategy is basin planning to control nonpoint pollution sources in rural watersheds undergoing development. The strategy addresses the traditional intertidal oyster and clam fisheries, the subtidal geoduck and hardshell clam fisheries, and the floating mussel aquaculture industry. Local governments will implement shellfish protection and closure strategies, which include identification of nonpoint sources of pollution and implementation of BMPs (PSWQA 1990b).

Other: Programs addressing on-site sewage disposal systems consist of BMP's and minimum standards that are enforced through local permit systems. State minimum standards and/or regulations also address mining, landfills, land application of sewage sludge, and underground storage tanks and may be enforced through the permit process. Construction and hydrologic projects are regulated for nonpoint source pollution through project permits with conditions. BMPs for groundwater protection have never been officially adopted. Boating waste BMPs are currently being developed for Puget Sound (boating wastes are addressed in more detail in the following section). Pesticide education programs target commercial and public entities and provide advice on the proper use and disposal of this nonpoint source of pollution (PSWQA 1990b).

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C. PLEASURE CRAFT DISCHARGES

Pleasure craft discharges are often considered a form of nonpoint source pollution. However, because there is no specific category for this form of water pollution, it is addressed as a separate topic in this report. Sewage discharges from recreational boats may be a significant source of water pollution in embayed areas, and may be of transboundary importance around the islands that straddle the international border.

Regulations concerned with recreational boat discharges have been in place in the U.S. since 1987, and have just begun to be promulgated in Canada. The discharge of sewage from boats is difficult to regulate and enforce, and in many cases, control relies on education and voluntary compliance. Washington has recently stepped up efforts to educate boaters about the harm of discharging untreated sewage into the state's waters, and has funded projects to make holding tank pump-out stations more accessible in Puget Sound. British Columbia works closely with the federal agency Transport Canada to regulate boaters on designated inland water bodies, and intends to make further designations on both marine and inland waters under the Federal Pleasure Craft Sewage Pollution Prevention Regulations under the Canada Shipping Act. These Regulations would be similar to the U.S. Regulations and would require holding tanks on boats in the designated areas.

CANADA/B.C. PLEASURE CRAFT DISCHARGES

Under its authority to regulate navigable bodies of water, the Canadian federal government has put forth a set of regulations prohibiting sewage discharges from recreational boats. However, these regulations apply only to bodies of water specially designated by the provinces.

Federal Role:

Under the Canada Shipping Act, Transport Canada is responsible for pollution control from pleasure and non-pleasure watercraft. This federal department has recently put forth two sets of regulations known as the Nonpleasure Craft Sewage Pollution Prevention Regulations and the Pleasure Craft Sewage Pollution Prevention Regulations. These regulations became law in November 1991.

The regulations pertaining to pleasure craft state that all recreational boats with toilets operating in waters designated by the province must have holding tanks. Operators of the craft must prohibit the discharge of sewage while a vessel is in designated waters. Violators may be fined heavily (maximum of $250,000). Commercial craft do not have to have holding tanks, but are not allowed to discharge into the designated waters.

Under the new regulations of the Canada Shipping Act, the provincial governments determine the bodies of water to which the regulations should apply. Thus, if a province chooses not to "determine" any waterbodies, then the regulations essentially do not exist for that province. Any body of water designated by the province is protected under both the pleasure craft and nonpleasure craft regulations.

B.C. Environment, Lands and Parks has nominated three freshwater bodies (Okanagan, Mara, and Shuswap Lakes) for the regulation. New boats on these lakes must comply with the regulations by December 31, 1991, while existing boats have until the end of 1992 to obtain holding tanks.

Provincial Role:

B.C. Environment, Lands and Parks is reviewing other bodies of water for inclusion in the new regulations. Public involvement will be included in the designation process. Environmentally sensitive areas in marine waters may be designated, but it is not likely that the regulations will apply to entire bodies of marine waters.

Neither the federal nor provincial governments have embarked on boater education campaigns. There are no plans to share the cost of complying with these new regulations with boaters or marinas. Pump-out facilities are limited in number in British Columbia, but will increase with the demand for such facilities as a result of further designations.

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U.S./WASHINGTON PLEASURE CRAFT DISCHARGES

The Clean Water Act gives the U.S. Coast Guard the authority to enforce regulations prohibiting pleasure craft discharges in navigable waters of Washington. Education and increased availability of convenient pump-out facilities have been pursued by both the state and federal government to increase voluntary compliance with the regulations.

Federal Efforts:

One goal of the 1987 amendments to the Federal Water Pollution Control Act was to entirely eliminate the direct discharge of untreated sewage from watercraft. Section 312 of the Clean Water Act addresses this issue. The EPA promulgated regulations requiring the use of permanently installed marine sanitation devices (MSDs) on boats less than 65 feet in length equipped with marine toilets. The MSD's are designed either to treat sewage prior to overboard discharge or to hold the sewage on board for shore-based disposal. These regulations apply to federally designated navigable waters, and discharges are not permitted within three miles of shore. The Coast Guard enforces these regulations (Ecology 1991), but does not regularly inspect recreational boats as it does commercial craft.

Many recreational boaters tend to discharge their holding-tank contents into marine and freshwater, rather than go through the pump-out procedures at stationary or fixed pump stations. At this time however, pump out facilities are not available in most Washington waters. To address this issue, the EPA and Puget Sound Water Quality Authority have jointly sponsored the development of a portable pump out system for boaters. Known as the New Moon Project, Honey Wagon Portable Pumpout system, this system should make the responsible discharge of boating wastes easier. The system is currently being tested around Puget Sound.

Other State Efforts:

Under the state's Nonpoint Source Assessment and Management Program, the Department of Health will draft a model ordinance requiring sewer hookups or other means of sewage disposal for live-aboards at public and private marinas. Local governments will be encouraged, not required, to adopt the ordinance.

The Washington State Parks and Recreation Commission has distributed state grant money for the installation of pumpouts and dump stations at public and private marinas. A two-year educational effort by the Commission will, among other things, encourage the use of MSD's, discourage anchoring near shellfish areas, and provide information on environmentally sound boat maintenance practices. The effort will also warn boaters of the potential for anchorage prohibitions if the program is unsuccessful in achieving water quality and shellfish standards in boating areas.

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D. OIL SPILL RESPONSE

Oil spill preparedness and response is one transboundary environmental issue that British Columbia and Washington have formally addressed through cooperative agreements and task forces. The two federal governments have also tackled the issue through international contingency planning. Both the province and the state have formal agreements with their respective federal governments concerning the roles of each agency during a spill event, and have defined their roles in preparing for such a spill. The U.S. Congress and Washington state have taken extra steps in legislating for oil spill prevention.

Because B.C. and Washington have worked together to resolve this transboundary pollution issue, this section specifically discusses joint response efforts in addition to summarizing the individual responses of B.C. and Washington.

CANADA/ B.C. OIL SPILL RESPONSE

The province of British Columbia protects and manages provincial Crown lands. These include all land between the high and low water mark (foreshore), the seabed of the Strait of Georgia, Strait of Juan de Fuca, and Queen Charlotte Sound-Johnstone Strait. The province also manages the coastal seabed between major headlands, except for Indian Reserves, National Parks, Ports, and all other federal lands, works and undertakings, or unless the land is privately owned (B.C. Env. 1990). The Canadian government is responsible for protecting federal marine resources. Spills from ships are primarily regulated under the pollution provisions of the Canada Shipping Act. Non-ship source spills which may impact federal marine resources are primarily controlled under the pollution provisions of the Fisheries Act. Regulations pursuant to the Canadian Environmental Protection Act and the Transportation of Dangerous Goods Act also afford the aquatic environment federal protection from spill pollution.

To facilitate spill management and clarify responsibilities between the two levels of government, Environment Canada and the B.C. Ministry of Environment, Lands and Parks became signatories of a "Memorandum of Understanding between Canada and British Columbia concerning Federal/Provincial Responsibilities in Oil and Hazardous Materials Spills" in 1981. This agreement is currently under review.

Federal Response:

Under the Memorandum of Understanding, a federal agency currently takes the lead for the following types of spills:

Circumstance	Lead Agency
■ from ships	Canadian Coast Guard
■ from federal facilities (or from any source to such facilities)	Environment Canada
■ of unknown origin in or to marine waters	Environment Canada
■ from land-based facilities to marine waters	Environment Canada
■ spills from any origin that threaten to cross the Canada/U.S. boundary waters.	Canadian Coast Guard
■ inland transboundary spills	Environment Canada

Most ship-borne spills in marine waters are managed by the Canadian Coast Guard, while land-based spills into marine waters are primarily the jurisdiction of Environment Canada. During significant spills which may impact many stakeholders, Environment Canada chairs and coordinates the Regional Environmental Emergency Team (REET). The REET membership varies with each spill but is typically comprised of representatives from pertinent federal Departments and provincial Ministries. REET meetings provide forums in which multi-disciplinary environmental concerns can be tabled and addressed. The REET chairman then provides the On Scene Commander (OSC) with environmental advice and concerns.

Provincial Response:

B.C. Environment, Lands and Parks is the lead provincial ministry for planning and response to marine oil spills. In consultation with federal agencies, the Ministry may take on-scene command of any spill that exceeds the capability of the polluter or when it is in the provincial interest to take action. In cooperation with the federal government, the Ministry of Environment, Lands and Parks may also take on-scene command when a polluter is not known, unable to respond, or has no contingency plan to guide its efforts. For the most part, however, unless provincial resources are threatened, the federal government plays the lead role in accordance with the Memorandum of Understanding.

In 1990, B.C. Environment, Lands and Parks drew up a Marine Oil Spill Preparedness and Response Strategy. In response to this strategy, three marine oil spill response teams now exist (for the North Coast, Vancouver Island, and Lower Mainland). Response by these teams is guided by a B.C. Marine Oil Spill Contingency Plan. B.C. Environment, Lands and Parks also maps identified provincial Crown resources (archaeological, ecological, cultural etc.) and sets priorities for their protection and clean-up. Most of the "high risk" areas of the coast have been videotaped by helicopter. An "Oil Spill Response Atlas" for the southern coast of Vancouver Island has also been prepared to guide response actions. The province is now focusing its inventory efforts on the Gulf Islands.

According to the Provincial Marine Oil Spill Response Strategy, the province also plans to provide training programs designed to establish community-based marine oil spill auxiliaries. In consultation with and with the participation of federal agencies, B.C. Environment, Lands and Parks will establish and maintain a training program in oil spill response for provincial staff, including field manuals, regular oil spill drills, public communication and education. During oil spills, the Ministry's Regional Oil Spill Response Team will conduct pretreatment surveys of affected shorelines in order to set treatment priorities, develop treatment recommendations, and evaluate post-treatment conditions.

Comprehensive, computerized inventory of oil spill response equipment stored and maintained by Canadian industry, international agencies, the Canadian Coast Guard, and local governments will be maintained and developed in cooperation with federal agencies and members of the State/B.C. Task force.

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U.S./WASHINGTON OIL SPILL RESPONSE

As in British Columbia, oil spill prevention and response are addressed at both the federal and state levels in Washington. The National Contingency Plan describes the roles of the different federal agencies. State and federal government jurisdiction is partially defined in the state's contingency plan and in the federally required Regional Contingency Plans, which address marine oil spill response within regions of the country. Pollution prevention regulations are encompassed primarily in the U.S. Oil Pollution Act of 1990 and Washington's 1991 Oil Spill Prevention Act.

Federal Response:

The federal Clean Water Act requires the establishment of a National Contingency Plan for oil spills. This contingency plan covers federal and state responsibilities, planning functions, cleanup procedures, administrative procedures, damage assessment, interagency coordination, and other response issues. The U.S. Environmental Protection Agency and the U.S. Coast Guard co-chair the national response team, which consists of representatives from fourteen federal agencies (PSWQA 1990a).

The National Contingency Plan requires the preparation of regional contingency plans to "describe more precisely the response functions and roles of federal, state, and local agencies within a geographical area" (PSWQA 1990a). Washington, Idaho, and Oregon make up Region Ten, while Alaska comprises its own region. Like the national response teams, the regional response teams are also co-chaired by the EPA and Coast Guard, and have twelve federal members and one representative from each of the three states.

The regional response team must prepare and maintain the contingency plan to identify the roles and responsibilities of agencies during spills of oil and hazardous substances. Working in committees, the response team develops response plans and guidelines, provides training and conducts spill exercises, reviews spill response efforts to identify and resolve response problems, and coordinates issues with state and local governments (PSWQA 1990a). In addition to regional response plans, the lead federal agency (the Coast Guard or EPA as described below) may also develop local response plans for specific areas, such as Puget Sound or the Columbia River.

An On Scene Coordinator (OSC) serves as the lead federal official for each spill and is responsible for coordinating all spill response activities. The Coast Guard is usually the OSC for the coastal zone (including Puget Sound) and the EPA for the inland zone. During major spills in Washington, the Department of Ecology shares a joint command with the federal OSC and the responsible party, but (according to the U.S. Oil Pollution Act) the lead federal agency is ultimately responsible for directing clean-up activities.

The federal Oil Pollution Act of 1990 also requires that spill response plans be prepared for tank vessels, offshore facilities, and some onshore facilities. The Act includes provisions for the prevention of oil spills through double hulled tank vessel requirements and regulations concerned with communication equipment, driver licensing, and personnel training (OPA 1990).

State Response:

As a member of the Regional Response Team, the state participates in response planning for the region. During a spill, the state's role is to alert downstream users of spills that threaten water uses, notify other state and local agencies, select disposal sites, provide for the security of all on-scene forces and equipment, assist EPA with risk assessment, help the Interior Department with wildlife rescue, and provide input on waste disposal priorities and decisions to use chemical dispersants (RRT 1991). Although the state does have some spill response equipment, its chief role is assisting in planning and developing priorities. In the case of small spills, responsibility for clean-up can be delegated by the federal agencies to the state.

The Department of Ecology is the lead agency under state law for managing spill response and preparing and revising the state contingency plan for oil and hazardous substances (PSWQA 1990a). In a statewide Master Plan, Ecology identifies each agency's role in oil spill response, and discusses the role of the Natural Resource Damage Assessment Team. This team consists of various resource agency representatives who assess and assign a dollar amount to spill-related resource damages and determine where the money for restoration should be spent. This task is aided by the establishment of environmental sensitivity maps, much like those in British Columbia.

Under the state's 1991 Oil Spill Prevention Act, many types of facilities and vessels that ship and handle oil must prepare detailed spill prevention plans in addition to the contingency plans required by the 1990 state legislation. With the 1991 Act, the Washington legislature also created the Office of Marine Safety, to be responsible for prevention and response planning for all vessels.

The state's Oil Spill Prevention Act incorporates and recodifies the state's existing oil spill statutes. Among other things, it authorizes studies on vessel safety standards, and the transportation of hazardous substances. It regulates pilotage requirements for vessels entering Puget Sound, directs the establishment of an emergency response system for the Strait of San Juan de Fuca, and places a five cent barrel tax on oil shipped into Washington. The proceeds from this tax will be used to finance a $25 million oil spill response fund as well as administration of the new statute. In addition to the money raised through this tax, the state is eligible for some federal reimbursement from the national Oil Spill Liability Trust Fund. The Trust Fund may assist the state in paying for oil spill response and natural resource damage assessment and restoration.

In all cases, the "spiller is responsible for immediately collecting and recovering the maximum feasible amount of oil spilled" (RRT 1991). The federal Oil Pollution Act states that federal liability limits do not preempt state limits, and that state liability can be unlimited. While state and federal governments may both seek civil penalties for water quality violations, generally only one will proceed with criminal action, often based on the most severe available penalties (PSWQA 1990).

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OIL SPILL RESPONSE, JOINT EFFORTS

Those spills that cross inland boundary waters are managed by Environment Canada and the U.S. Environmental Protection Agency under the Canada-United States Joint Pollution Contingency Plan (1985). For those spills that cross international marine waters, the Canadian and U.S. Coast Guards respond according to the Canada/U.S. Joint Marine Pollution Contingency Plan.

When the spill is from an unknown source or a vessel, the co-chairs of the Joint Response Team for the Marine Pollution Contingency Plan are the senior U.S. Coast Guard representative (in Region Ten the co-chair of the Regional Response Team) and the Regional Marine Emergency Officer of the Canadian Coast Guard. When the spill is from a shore-based source to marine waters, the Canadian chairperson is usually the Regional Emergency Coordinator of Environment Canada's Environment Protection (PSWQA 1990a).

Through the BC/States Oil Spill Memorandum of Cooperation, British Columbia, Alaska, Washington, Oregon, and California are working to improve transboundary response and information sharing regarding oil spills. The Oil Spill Task Force meets annually to report on events of mutual benefit in oil spill preparedness, prevention, and response. The signatories of this memorandum also agree to share equipment, coordinate wildlife rescue, set up command posts, and help facilitate communication in the event of a major oil spill. Task Force subcommittees recommend and implement actions related to oil spill prevention, emergency response, financial recovery, technology sharing and risk assessment (Task Force 1990). The activities of the Task Force should occur within the framework of the Canada-U.S.A. Joint Marine Pollution Contingency Plan.

E. DREDGING

Dredging is important to the economic well-being of many water-uses, including waterborne transportation and recreation, but can contribute to the degradation of water quality through the disturbance of contaminated sediments, increased water turbidity, reduced dissolved oxygen levels, and the destruction of aquatic habitat. Dredging activities are regulated in both British Columbia and Washington through established review processes and agency assessments. In British Columbia the federal government plays a dominant role, while in Washington, different agencies have different permitting and review requirements for dredging activities. Dredging proposals in the Fraser River Estuary and Burrard Inlet undergo a single coordinated review process, unlike counterpart proposals in other parts of the Province. In Washington, coordinated review processes for dredging proposals do not formally exist.

CANADA/B.C. DREDGING

More than half of the dredging in British Columbia occurs in the Fraser River (due to the river's sediment carrying capacity), but some dredging activities occur in the province's other major harbors and industrial sites. Dredging activities are primarily a federal responsibility, in response to marine navigation needs. Provincial ministries provide comments during the review process.

Federal Responsibilities:

The Canada Shipping Act and Navigable Waters Protection Act, administered by the Canadian Coast Guard (a component of Transport Canada) are the prime regulatory means for protecting marine navigation. The Canadian Coast Guard, Waterways Development Group has overall responsibility for maintenance of commercial navigation channels and approaches. Outside the boundaries of commercially navigable waters, the federal Harbor Commissions maintain berths and mooring areas. The Small Craft Harbors Branch of Fisheries and Oceans Canada maintains designated approaches and harbors for commercial fishing fleets and recreational boaters.

These three federal entities do not dredge waterways themselves. The Harbor Commissions typically contract the jobs out to private dredging operations, while the federal departments contract with Public Works Canada. Public Works may perform the operation, or may in turn contract out to a private operation.

Any proposed dredging operation on the Fraser River must have the approval of the habitat management arm of Fisheries and Oceans Canada (DFO), which implements the Fraser River Dredging Guidelines. These guidelines seek to minimize conflict with the river's fisheries resources by regulating timing, location, equipment, and disposal of dredged material. An approval for dredging may be issued provided that a proposal has been approved by DFO pursuant to the Fisheries Act and the no net loss guiding principle of the Fish Habitat Management Policy (DFO 1986).

The guidelines apply to dredging within navigable channels. Outside of the channels, restrictions are applied on a site-specific basis. The disposal of dredged material in the area of the river subject to tidal influence requires approval by Environment Canada and Fisheries and Oceans Canada under the Ocean Dumping Regulations of the Canadian Environmental Protection Act (see Section F, Ocean Dumping).

Every dredging project must go through the Environmental Assessment and Review Process, a screening process whereby a federal agency can assure itself that a project complies with legislation and guidelines and includes adequate mitigative measures. Dredging within the Fraser River must also go through the Fraser River Estuary Management Program (FREMP, discussed in Section H) permit review process, coordinated by the Environmental Review Committee made up of Environment Canada, the Department of Fisheries and Oceans, and the B.C. Ministry of Environment, Lands and Parks. (FREMP 1991)

Provincial Responsibilities:

B.C. Environment, Lands and Parks participates in the FREMP review process and offers comments on proposed dredging projects. In areas outside of designated federal harbors, the province is deemed to be the owner of the channel bed and concurrence for dredging must be obtained from the Ministry of Environment, Lands and Parks as well as from federal regulatory agencies.

Federal Contact:
Fred Stepchuk
Canadian Coast Guard
Transport Canada
(604) 631-3792

Provincial Contact:
Region 2,
Brian Clark
B.C. Environment, Lands and Parks
(604) 584-8822

U.S./WASHINGTON DREDGING

The U.S. Army Corps of Engineers and Environmental Protection Agency make final permitting decisions regarding whether a dredging activity can occur. Several state laws and codes regulate dredging activities to protect coastal zones, fisheries, aquatic habitat, and water quality. Some facets of the permit approval process are coordinated among agencies. This section applies only to the actual dredging process, disposal of dredged material is discussed in the following Section.

Federal Role:

Section 10 of the Rivers and Harbors Act of 1899 gives the federal government authority to regulate dredging activities. The U.S. Army Corps of Engineers is responsible for dredging federally authorized navigation projects, while responsibility for dredging of ports and private marinas varies. In all cases, private and public (non-Corps) dredging activities require a Section 10 permit from the Army Corps. Permit applications are typically for a combined Section 10 and Section 404 (of the Clean Water Act) openwater disposal permit.

During permit review, the Corps and the U.S. Environmental Protection Agency consider whether the dredging activity might affect cultural, natural, or recreational resources. Reviewers also consider federal laws such as the Fish and Wildlife Coordination Act and the Migratory Bird Act. A public interest review process for both dredging and disposal provides a means for public comment, which is taken into account in the final permitting decision. Other federal and state agencies also provide comment for the final decision.

State Role:

All dredging activities that occur within the high water marks of state waters that contain anadromous fish species must receive a Hydraulic Project Approval (HPA) from the Washington State Department of Fisheries (the Department of Wildlife issues permits for dredging in other waters). The Hydraulic Code Rules, from which the Department of Fisheries acquires its mandate to issue approvals, state that "A hydraulic project approval will be denied when...the project is directly or indirectly harmful to fish life unless adequate protection, mitigation, or restoration can be assured by conditioning the approval or altering the proposal (PSWQA 1990c)."

Most project proponents must also go through the state's environmental review process, and obtain a water quality variance from the regional office of the Department of Ecology. This variance gives the dredger permission to violate water quality criteria for a specified period of time, in a specified dilution zone, and typically refers to water turbidity and dissolved oxygen levels which the proponent may not violate.

Under the Shoreline Management Act, most county Master Plans define dredging and delineate what types of dredging activities are acceptable. In many cases, if a proposed dredging project occurs in waters identified in a county's master plan, the proponent must obtain a shoreline permit the state Department of Ecology.

Federal Contact:
Dave Kendall
U.S. Army Corp of Engineers
(206) 764-3768

State Contact:
Duane Phinney
Department of Fisheries
(206) 753-6650

John Malek
U.S. Environmental Protection Agency
(206) 553-1286

F. OCEAN DUMPING/ DREDGED MATERIAL DISPOSAL

The disposal of materials into marine waters is known as "ocean dumping" in British Columbia and as "dredged material disposal" in Washington. In both the state and the province, dredged materials (mostly sediments) are the primary component of the total substances disposed. The disposal of materials into ocean waters is of concern to environmental managers on both sides of the border. These managers evaluate the types of substances dumped, the effects of this dumping on living resources and water quality, and the dispersal rates. Open-water disposal, if not managed carefully, may pose a threat to marine life and aquatic habitats.

In British Columbia, ocean dumping is regulated by the federal government, with some provincial input. In Washington, the federal government has prime responsibility for disposal sites in national ocean waters, while different levels of government share responsibility for disposal sites in inland waters.

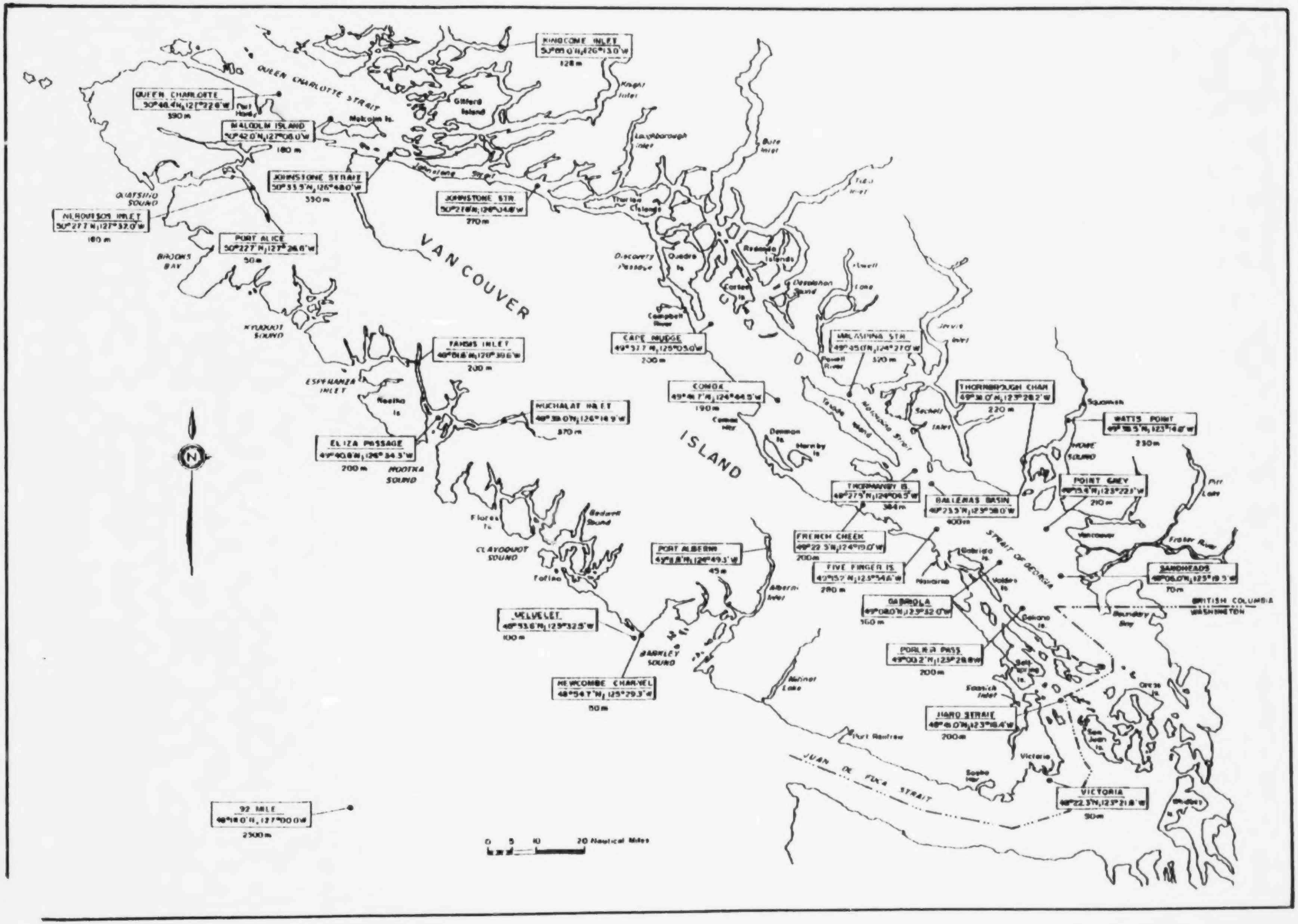
CANADA/B.C. OCEAN DUMPING

In British Columbia, Ocean Dumping is regulated and monitored by the federal government, through Environment Canada. The Province plays a minor role in reviewing ocean dumping permits, but does not typically play an active role in regulating ocean dumping.

Federal Role:

The regulatory authority for ocean dumping is given to the federal government by Section VI of the Canadian Environmental Protection Act (CEPA), which encompasses most of the nation's major ocean dumping rules. Within Environment Canada, Environmental Protection regulates ocean dumping off the shores of Canada, as well as the dumping into international waters of any materials derived in Canada. Most disposals off the coast of British Columbia consist of dredged materials from the Fraser River channel and harbor maintenance, as well as woodwastes and sediments from forest industry operations (mills, log storage, and sorting areas). Disposal of materials into

Figure 11:
Ocean Dump Sites in Southern British Columbia


KINGCOME INLET
50°59.0'N, 126°13.0'W
128 m
QUEEN CHARLOTTE
50°46.4'N, 127°22.6'W
390 m
MALCOLM ISLAND
50°42.0'N, 127°06.0'W
180 m
JOHNSTONE STRAIT
50°33.5'N, 126°48.0'W
330 m
JOHNSTONE STR.
50°27.8'N, 126°04.8'W
270 m
NEROUTSOS INLET
50°27.7'N, 127°32.0'W
180 m
PORT ALICE
50°22.7'N, 127°26.6'W
50 m
TAHSIS INLET
49°51.8'N, 126°39.6'W
200 m
MUCHALAT INLET
49°39.0'N, 126°14.9'W
370 m
ELIZA PASSAGE
49°40.8'N, 126°34.3'W
200 m
CAPE MUDGE
49°57.7'N, 125°05.0'W
200 m
COMOX
49°41.7'N, 124°44.5'W
190 m
MALASPINA STR.
49°45.0'N, 124°27.0'W
320 m
THORNBROUGH CHAN
49°30.0'N, 123°28.2'W
220 m
WATTS POINT
49°38.5'N, 123°14.0'W
230 m
THORMANBY IS.
49°27.5'N, 124°04.5'W
384 m
BALLENAS BASIN
49°23.3'N, 123°58.0'W
400 m
POINT GREY
49°13.4'N, 123°22.1'W
210 m
FRENCH CREEK
49°22.3'N, 124°19.0'W
200 m
FIVE FINGER IS.
49°15.7'N, 123°54.6'W
280 m
PORT ALBERNI
49°8.8'N, 124°49.3'W
45 m
SANDHEADS
49°06.0'N, 123°19.3'W
70 m
GABRIOLA
49°08.0'N, 123°32.0'W
160 m
UCLUELET
48°53.6'N, 125°32.5'W
100 m
PORLIER PASS
49°00.2'N, 123°28.8'W
200 m
NEWCOMBE CHANNEL
48°54.7'N, 125°29.3'W
50 m
HARO STRAIT
48°45.0'N, 123°18.4'W
200 m
VICTORIA
48°22.3'N, 123°21.8'W
90 m
92 MILE
48°18.0'N, 127°00.0'W
2500 m
QUEEN CHARLOTTE STRAIT
Port Hardy
Malcolm Is.
Gilford Island
Knight Inlet
Loughborough Inlet
Bute Inlet
Toba Inlet
Johnstone Strait
Thurlow Islands
QUATSINO SOUND
BROOKS BAY
KYUQUOT SOUND
ESPERANZA INLET
Nootka Is.
NOOTKA SOUND
VANCOUVER
ISLAND
Discovery Passage
Quadra Is.
Redonda Islands
Cortes Is.
Desolation Sound
Powell Lake
Campbell River
Powell River
Jervis Inlet
Texada Island
Malaspina Strait
Sechelt Inlet
Squamish
HOWE SOUND
Comox Hbr
Denman Is.
Hornby Is.
Flores Is.
Bedwell Sound
CLAYOQUOT SOUND
Tofino
BARKLEY SOUND
Alberni Inlet
Nanaimo
Gabriola Is.
Valdes Is.
STRAIT OF GEORGIA
Galiano Is.
Saltspring Is.
Saanich Inlet
Nitinat Lake
Port Renfrew
JUAN DE FUCA STRAIT
Sooke Hbr
Victoria
San Juan Is.
Orcas Is.
Whidbey Is.
Vancouver
Fraser River
Pitt Lake
Boundary Bay
BRITISH COLUMBIA
WASHINGTON
N
0 5 10 20 Nautical Miles

marine waters is regulated through permits, the conditions and terms of which vary with the substances being dumped. Some disposal operations regulated in other federal, provincial and municipal legislation (such as ship and municipal waste discharges) are exempt from the Ocean Dumping Section of CEPA.

Under Section VI of CEPA, the Environment Minister permits dumping at sea only in cases where the disposal of the substances both meets the regulatory requirements and is the environmentally preferable and practical alternative. Decisions to permit and permit requirements are made on a case-by-case basis, and depend partially upon the toxicity and type of material being dumped.

Substances which present major bioaccumulation, toxicity, and persistence problems to human health and the aquatic environment are listed in Schedule III, Part I of CEPA. The dumping of Part I substances is heavily regulated with very stringent numerical limits, and in most cases is prohibited.

Schedule III, Part II substances are those which might pose serious hazards when disposed. Existing guidelines define environmentally significant amounts of the substance. These materials may be dumped only in small quantities.

Schedule III, Part III of CEPA describes those factors which must be considered in reviewing all permit applications. These factors encompass the characteristics and composition of the substance and the characteristics of the dumping site and method of deposit.

Permit applications are first submitted to Environmental Protection, which refers applications to the relevant federal and provincial departments and port authorities. Comments from the referrals are submitted to the Regional Ocean Dumping Advisory Committee, comprised of two representatives from Fisheries and Oceans and chaired by a representative from Environment Canada. This committee compiles the comments into one recommendation, either for approval to issue a permit for all or part of the project or denial of the application, and presents the recommendation to the Minister of the Environment.

Once the material has been approved for open water disposal, Environmental Protection typically authorizes it to be deposited at the designated site closest to the disposer, in order to minimize transportation costs. This results in certain sites, such as those near the mouth of the Fraser River, being used more extensively than others. Active dump sites in southern British Columbia are shown in Figure 11. Five dumpsites not shown are located in the northern part of the Province, but these are seldom used. Those sites used most frequently are Point Grey and Sandheads (which receives most of the maintenance dredging materials from the Fraser River). Environment Canada routinely carries out a program of monitoring and impact assessment of ocean dumping activities.

Provincial Role:

Although the province is responsible for the beds of inland coastal waters, it does not play a major role in regulating ocean dumping in such waters. The Ministry of Environment, Lands and Parks receives permit referrals from Environment Canada, and makes an effort to point out permitted discharges and/or nonpoint problems in areas to be dredged.

Federal Contact:
Duane Brothers
Ocean Dumping Control Program
Environment Canada
(604) 666-2990

Provincial Contact:
Laura Hensel
Environmental Monitoring
Region 2
B.C. Environment, Lands and Parks
(604) 584-8822

U.S./WASHINGTON DREDGED MATERIAL DISPOSAL

In Washington, the term "dredged material disposal" replaces the Canadian phrase "ocean dumping" and includes the disposal of materials in Puget Sound, Grays Harbor, Willapa Bay, and the Columbia River, as well as in the ocean. The disposal of dredged material is regulated under the federal Ocean Dumping Act and the Clean Water Act. In Puget Sound, disposal is monitored and evaluated under the Puget Sound Dredged Disposal Analysis, which is implemented through the cooperative efforts of two state and two federal agencies. Disposal sites in Puget Sound are shown in Figure 12.

Federal Role:

Ocean dumping is regulated in the United States under Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972 (Ocean Dumping Act) and under Section 404 of the Clean Water Act (CWA). Section 103 of the Ocean Dumping Act regulates the disposal of dredged materials into "ocean waters" (national and state waters). Section 404 requirements typically refer to disposal of dredged material into state waters or intertidal lands. There is some overlap in jurisdiction between these two federal laws, and in such cases the purpose of the disposal determines which law is followed.

The Environmental Protection Agency (EPA) has developed and promulgated criteria (under Section 103) and guidelines (under Section 404) with which dredged materials must comply before a permit can be issued. The requirements of both laws are similar, although not identical. In 1991 the U.S. Army Corps of Engineers and the EPA released the Green Book, a national manual that provides guidance for the testing of dredged material proposed for disposal in ocean waters. The two federal agencies are currently developing a companion manual for Section 404 waters. Materials disposed of in Puget Sound must comply with the requirements of PSDDA (discussed below), which must comply with the national guidance.

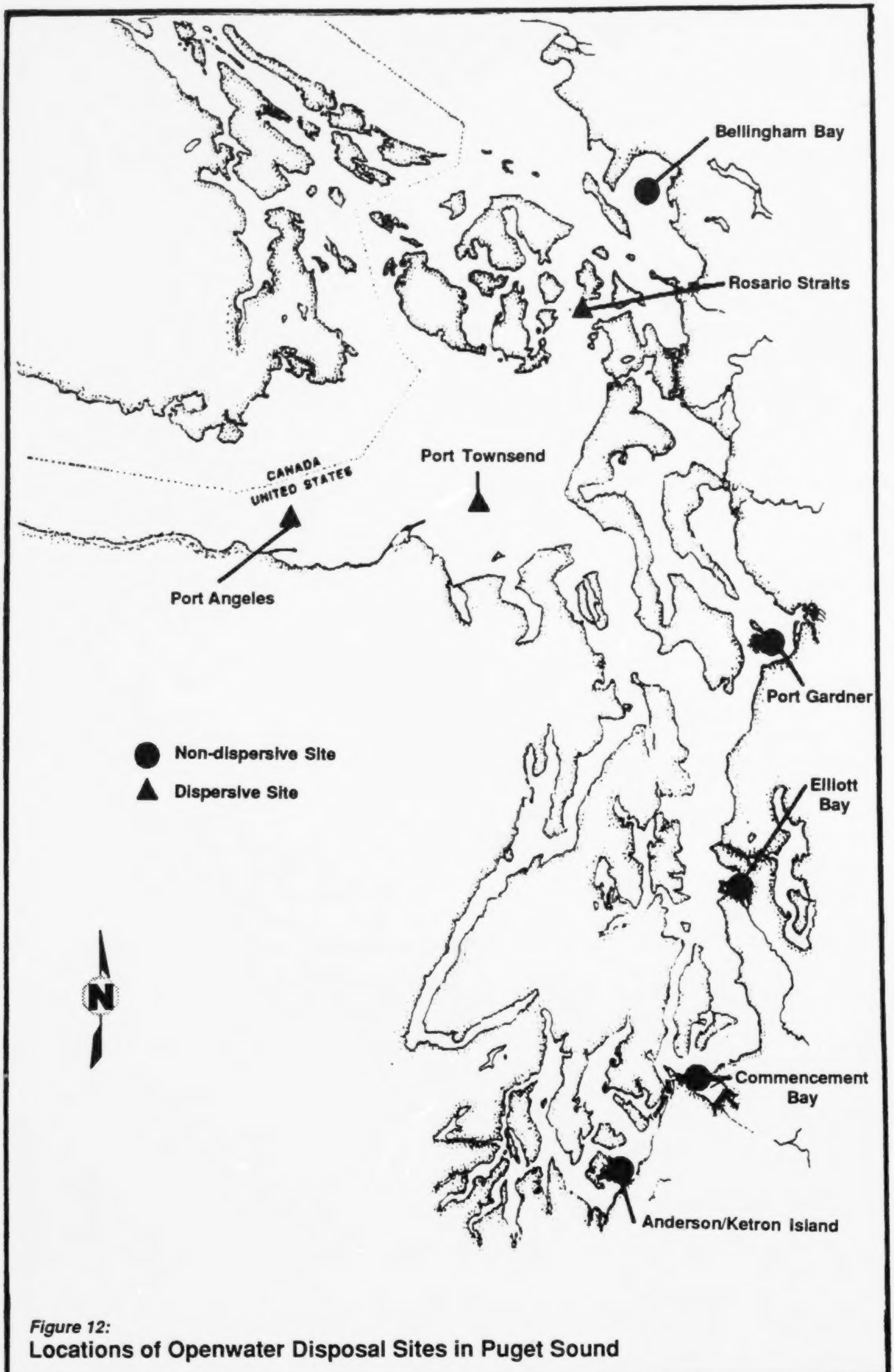

Bellingham Bay
Rosario Straits
Port Townsend
CANADA
UNITED STATES
Port Angeles
Port Gardner
● Non-dispersive Site
▲ Dispersive Site
Elliott Bay
N
Commencement Bay
Anderson/Ketron Island

Figure 12:
Locations of Openwater Disposal Sites in Puget Sound

The U.S. Army Corps of Engineers is the federal permitting authority for ocean dumping, but the EPA independently reviews and comments on proposed dredged material disposal projects. Under Section 103 of the Ocean Dumping Act, the EPA must concur before the Corps issues a permit or waiver. The EPA also has final veto authority over Section 404 permit applications approved by the Corps. This Section 404 veto authority has been used nationally to protect wetlands, but in the Pacific Northwest the EPA has seldom had to use its veto authority.

Public notice (and opportunity for comment) is required as part of the Corps' regulatory process. Comments are requested from interested parties and relevant agencies. The public can also provide comment on overall disposal practices through public Annual Review Meetings under PSDDA (see below), but at these meetings the public does not have the opportunity to comment on individual PSDDA permits. Regardless of whether the disposal is to occur in state or national waters, compliance monitoring (inspection during actual dredging and disposal) and site management monitoring can be required of the permit applicant. The EPA and Corps have primary responsibility for site management, although state agencies may take the lead in Section 404 Waters.

State Role:

Under Section 401 of the Clean Water Act, the Department of Ecology certifies that a proposed discharge will comply with the applicable provisions of state and federal water quality law. The 401 certification is mandatory for Section 404 waters (state and inland) but not usually required for disposal sites in the open ocean. State waters extend three miles into the open ocean.

In addition to the federal laws mentioned above, disposal off the coast of Washington must comply with the requirements of the state's Shoreline Management Act, administered by the Department of Ecology. According to the Act, a proposed disposal site along state shores requires a shoreline permit from the local government. This permit is approved or rejected by Ecology. In Puget Sound, the Department of Natural Resources (DNR) manages state-owned tidelands and bedlands, including the dredged materials disposal sites, and issues permits to each disposal site user in state waters. In the Sound DNR is responsible for ensuring that disposal sites and disposers are in compliance with the Shoreline Management Act, through the PSDDA process.

Puget Sound Dredged Disposal Analysis (PSDDA):

PSDDA was created in 1985 as a joint effort of the Corps of Engineers, EPA Region 10, and the state departments of Natural Resources and Ecology. The purpose of the project was to identify acceptable disposal sites, define evaluation procedures for materials to be placed at those sites, and to formulate site-use management plans (Tilley et al 1987). The planning effort was completed and implementation began in 1989. The program applies to all open-water dredged material disposal within Puget Sound.

The PSDDA agencies identified eight PSDDA sites in Puget Sound, and developed disposal criteria drawing on the criteria and guidelines promulgated by the EPA under the two federal laws. The PSDDA evaluation process consists of four tiers, including biological testing and chemical analyses of dredged sediments. Once a material has been tested and determined to be suitable for disposal, a Determination of Suitability is signed by the four PSDDA agencies (EPA, Corps, Ecology, DNR). The public notice is then released.

Under PSDDA, the Corps and DNR are the lead agencies for inspecting disposal operations and performing long-term monitoring and management of the site. The Corps typically monitors the physical attributes of the site while DNR is responsible for the chemical and biological monitoring.

Federal Contact:
John Malek
Water Resources Assessment
Environmental Protection Agency
(206) 553-1286

PSDDA Contact:
Gene Revelas
Division of Aquatic Lands
Department of Natural Resources
(206) 586-2893

G. WETLANDS PROTECTION

Both Canada and the U.S. recognize the ecological, economic, and aesthetic importance of wetlands. Canada's Green Plan summarizes these values: "Canada's wetlands form an important part of our landscapes and harbor perhaps the richest mix of wildlife of any group of complex ecosystems in the country. In addition, wetlands are an integral part of our freshwater systems, providing a range of benefits to Canadians, including natural flood control, water cleansing, and groundwater recharge." Wetlands protection may be significant to transboundary concerns as they affect water quality and may influence the abundance and health of shared living resources.

Even with this realization, wetlands in British Columbia and Washington are protected by an uncoordinated array of federal, state and provincial policies, none of which are strictly dedicated to wetlands protection. The Puget Sound Comprehensive Conservation and Management Plan, also known at the state level as the Puget Sound Water Quality Management Plan (see Section H, Estuary Management Programs), seeks to coordinate protective policies in the Puget Sound region and to encourage local governments to adopt protective ordinances, but no comprehensive program exists for the entire state. B.C. and Washington protect wetlands primarily through land protection, permit reviews, water quality control, and land-use policies.

In Washington, both federal and state agencies have been ordered to consider wetlands protection in all programs and policies. Through the Green Plan, Canada is also moving in this direction. Both B.C. and Washington have intensively inventoried their coastal wetlands resources. While the 1991 Puget Sound Water Quality Management Plan recommends, and Ecology has initiated, a wetlands monitoring program to determine rates of decline or increase, no such monitoring program exists in British Columbia. Both sides of the border lack unified (among agencies or reports) definitions of what the term "wetlands" encompasses.

CANADA/B.C. WETLANDS PROTECTION

A commonly used Canadian definition of wetlands is "lands that have the water table at, near or above the land surface or which are saturated for a long enough period to promote wetland or aquatic processes as indicated by hydric soils, hydrophilic vegetation and various kinds of biological activity which are adapted to the wet environment" (Pilon and Kerr 1984). Wetlands in British Columbia can be protected by both the federal government and the province, although neither level of government yet has a formal wetlands policy.

Federal Protection:

The Government of Canada is currently developing a Federal Policy on Wetland Conservation. Elements of this policy will include "a system of secured wetlands of national importance; protection of wetlands on federal lands such as national parks, national wildlife areas and National Capital Commission lands; and wetland conservation as a fundamental goal of all federal land-use decisions." Currently, however, federal protection of wetlands fits into a number of different laws and regulations.

Under the auspices of migratory bird protection, the Canadian Wildlife Service of Environment Canada can protect waters frequented by migratory birds and can purchase, acquire, or lease lands for migratory bird research, conservation, and interpretation. The Pacific Coast Joint Venture, an element of the North American Waterfowl Management Plan covering B.C., Washington, Oregon, and northern California, authorizes the federal and provincial government to save and protect wetlands for migratory birds and other wildlife. Participants in the venture, who include the Canadian Wildlife Service, B.C. Environment, Lands and Parks, various nongovernmental organizations, and forestry, agricultural, and municipal interests, are currently developing a five year plan to identify significant wetlands and earmark money for land acquisitions, transfers, and cooperative agreements with landowners.

The Fisheries Act is the strongest existing legislative mandate for wetlands protection in the province. This Act gives the federal government jurisdiction over wetlands protection through its emphasis on preserving fish habitat, but protection applies only to those wetlands that serve as fish habitat. Fisheries and Oceans Canada (DFO) has a Fish Habitat Management Policy with a guiding principle of no net loss of the productive capacity of fish habitat, and an overall goal of net gain of fish habitat. Under the Policy, DFO reviews any development permit application that might affect habitat. Based on the Fish Habitat Management Policy's stated hierarchy of preferences, in sensitive areas DFO may require project relocation, can recommend mitigative actions, or request changes be made in the project design so that wetlands are adequately protected (DFO 1986).

In addition to protecting fisheries through permit review, the federal government also reviews applications for proposed projects that affect navigable waters. The current federal environmental review process requires that any project needing any type of federal input must go through the entire formalized process. This requirement gives the federal government a large role in the assessment of development projects that may affect ecologically significant lands.

Provincial Protection:

Through the Wildlife Act, the Ministry of Environment, Lands and Parks is authorized to create Wildlife Management Areas and to work with other agencies and nongovernmental organizations to increase the availability of wildlife habitat through restoration, enhancement, and protection. Such programs rely upon government encouragement and adequate funding, and have been pursued in a largely ad hoc manner.

B.C. Environment, Lands and Parks, can assist in the protection of wetlands in a number of ways. Because this Ministry has jurisdiction over foreshore lands, most waterfront development needs a permit from this Ministry. Depending upon the magnitude of the project, the agency refers permit applications to other relevant federal and provincial agencies for comment.

Through an "order-in-council," B.C. Environment, Lands and Parks can designate an area as having special ecological value. Under the Land Act, the Ministry can transfer these ecologically significant lands to other agencies for management. The Act supports provisions for a variety of reserves and designations which can be used to identify sensitive lands. The Ministry might also denote map-reserves (reserves drawn on a map but not actually developed) for temporary protection of a wetland, or use short- and long-term notations-of-interest to signify a potential stake in specific areas by another agency (Day 1990).

Under the Ecological Reserve Act, public lands with special ecological values may be designated and protected as Ecological Reserves. Restrictive covenants can also be used in specific situations to protect lands from potentially adverse development. Special interest groups, such as the Nature Trust, often purchase environmentally sensitive lands as a means of ensuring they will remain in their natural state.

Under the B.C. Water Act, any development in almost any water body must be approved by the Water Management Division of B.C. Environment, Lands and Parks. If an individual wants to develop private property, then he or she goes through the municipal approval process. Some municipalities, though not all, refer the applications to relevant federal and provincial agencies for comment.

Any permit applications for activities that might adversely impact habitat within the Fraser River Estuary go through the Fraser River Estuary Management Plan (FREMP) Environmental Review Committee. This committee consists of members from port authorities and a variety of federal, provincial, and municipal agencies, and serves to coordinate the review process for specific projects.

Federal Contact:
Jerry Townsend
Canadian Wildlife Service
Environment Canada
(604) 946-8546

Provincial Contact:
Jack Evans
Wildlife Biologist
B.C. Environment, Lands and Parks
(604) 584-8822

U.S./WASHINGTON WETLANDS PROTECTION

Regulated wetlands have been defined as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (PSWQA 1990b). This definition generally includes swamps, marshes, bogs, and similar areas; wetlands created for mitigation and those modified for approved land use activities; and ponds under twenty acres including their submerged aquatic beds (PSWQA 1990b).

Several laws passed in Washington and the U.S. over the last 20 years have resulted in programs regulating protection of virtually all estuarine wetlands and some freshwater wetlands, but there is no single, comprehensive state-wide legislation that specifically addresses the management, restoration, and protection of wetlands in Washington. Despite the myriad of protective policies, the Department of Ecology estimates that between 700 and 2,050 acres of wetlands are lost each year throughout the state, and that more than half of the wetlands along the coasts and riverbanks of Puget Sound have been destroyed by human activity (PSWQA 1990b). These continued losses may be due to the fact that the laws are not comprehensive, giving only partial or piece-meal benefit. Under many of the laws, wetlands protection is discretionary rather than mandatory, and programs may be under-funded and uncoordinated among different levels of government (PSWQA 1990b).

Federal Protection Efforts:

Executive Order 11990, Protection of Wetlands, mandates that federal agencies must protect, preserve, and enhance wetland habitats. Although Executive Orders state the policy promoted by the President (or the Governor, in the case of a state Executive Order) this policy must be implemented along with the conservation/development policies of each agency, and may only be as strong as the will of the agency managers (PSWQA 1986c). Through the National Environmental Policy Act, however, federal activities are reviewed for their impacts on natural resources, including wetlands.

Under Section 404 of the Clean Water Act, the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers jointly implement a permit program that regulates the discharge of dredge or fill material into waters of the U.S., including wetlands. Permit applications are evaluated by substantive environmental criteria, known as Section 404(b)(1) guidelines, and the EPA has the ability to veto permits that would result in significant environmental damage (EPA 1988).

The U.S. Fish and Wildlife Service (USFWS) acquires migratory waterfowl habitat (i.e. wetlands) for inclusion in the National Wildlife Refuge System. Through the Migratory Bird Conservation Act, the USFWS participates in a Pacific Flyway Joint Venture to acquire critical flyway habitat through private and public partnerships (e.g. working with the Army Corps of Engineers to acquire or restore multi-use flood plains). The 1986 Emergency Wetlands Resources Act expands and enhances sources of funds for wetlands acquisition and directs the Department of the Interior to develop a National Wetlands Priority Conservation Plan that identifies the type of wetlands and wetland interests to be given priority for acquisition (EPA 1988). In cooperation with EPA and Ecology, USFWS has become involved in restoration activities under guidance from the 1991 Puget Sound Water Quality Management Plan.

The Swampbuster provision of the 1990 amendments to the Food Securities Act states that any person who converts wetlands to make possible the production of an agricultural commodity will be ineligible for most U.S. Department of Agriculture cost-share assistance. Other federal laws pertaining to wetlands include the Estuary Protection Act, Marine Mammal Protection Act, Coastal Zone Management Act, and the Fish and Wildlife Protection Act.

Under the EPA's National Estuary Program, the federal government and state agencies have worked together to produce the Comprehensive Conservation and Management Plan for Puget Sound (also known as the 1991 Puget Sound Water Quality Management Plan). One element of this plan concerns wetlands. This element encompasses enhanced local and state regulatory protection for wetlands; wetlands acquisition; an interagency tracking and inventory system; and public education and wetlands restoration. The achievement of these goals thus far has been limited due to funding constraints.

State Protection Efforts:

The Governor's Executive Order 90-04 (of 1990) declares that "all state agencies shall rigorously enforce their existing authorities to assure wetlands protection." The Executive order also stated that, where legally permissible, all state agencies should amend their State Environmental Policy Act (SEPA) policies to include wetlands protection components and should exercise their authority under SEPA to require mitigation of wetlands impacts for all agency actions affecting wetlands. (Under SEPA, the activities of all state and local agencies are subject to environmental review and public comment).

The Department of Ecology, Wetlands Section addresses wetlands protection issues in a comprehensive program, partially funded with money from the federal Coastal Zone Management Act. Through this effort, Ecology provides technical assistance to local governments and state and federal agencies to determine wetlands boundaries, inventory and map wetlands, and mitigate development. Staff address regulatory policy issues, provide guidance to local jurisdictions, administer a wetlands acquisition/preservation program. Efforts are beginning to be made on wetlands restoration. Public outreach and education are a large component as well (Ecology 1989). Ecology is currently developing state water quality standards to better protect wetlands.

Under the Shoreline Management Act, local governments develop local land-use plans for all shorelines within their jurisdiction. Guidelines for planning are oriented toward balancing development with habitat protection and other shoreline interests (i.e. public access). The plans are implemented through a permit process. This process is lead by the local government and permits are reviewed by Ecology. Public comment and hearings provide essential review components (PSWQA 1986c).

Section 401 of the Clean Water Act provides that no federal license or permit for discharges to navigable waters be issued until the Department of Ecology certifies that the discharge complies with state water quality standards. Over the last several years, Ecology has begun to use the certification process to protect wetlands, and this process remains one of the most significant mechanisms for the state to use in protecting wetlands (PSWQA 1986c).

The Department of Ecology has also drafted a model wetlands protection ordinance for local governments to consider as they develop local ordinances. This is part of state-wide legislation, the Growth Management Act, which calls for comprehensive local wetlands protection through developing local permit systems for a broad range of activities affecting wetlands and other critical areas.

The state Departments of Wildlife and Fisheries must approve virtually any project in state waters if those waters support fish life. This is known as Hydraulic Projects Approval (HPA). The Department of Fisheries is the lead agency for activities occurring west of the crest of the Cascades, the Department of Wildlife for those on the east side. These two agencies have promulgated regulations establishing evaluation criteria for the approval of permit applications, but the approval process helps protect only those wetlands significant to fish, not other types of wildlife (PSWQA 1986c).

The Department of Natural Resources contributes to wetlands protection through the Natural Heritage Program (which identifies wetlands of special ecological significance) and the Natural Area Preserve Program (which acquires significant natural areas, including wetlands). As the manager of state-owned aquatic lands, DNR has the ability to protect wetlands through lease conditions and other means.

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State Contact:
Mary Burg
Wetlands Section
Department of Ecology
(206) 459-6790

H. ESTUARY MANAGEMENT PROGRAMS

Since 1985 both Washington and British Columbia have had comprehensive programs geared toward managing the quality of their major estuaries. Because the waters of both estuaries may be affected by pollutants traveling across the international border, and the management of one watershed may thus be significant to the health of the other, it is important to understand the differences and similarities between these two major estuary programs.

The Fraser River Estuary Management Program in British Columbia funnels federal, provincial, and local government efforts and resources into one coordinated program to protect the estuary and maintain its economic vitality. The program focuses not only on managing the estuary's water quality, but also addresses industrial development, waste management, recreation, dredging, and other issues.

Unlike the Fraser River Estuary Management Program, Washington's Puget Sound Water Management Plan primarily addresses water quality issues (as opposed to economic development initiatives, for example), and an appointed, eleven member Water Quality Authority leads a well-staffed, state agency created to address these issues. Other estuary programs in Washington will be discussed in the section entitled "Marine Protected Areas."

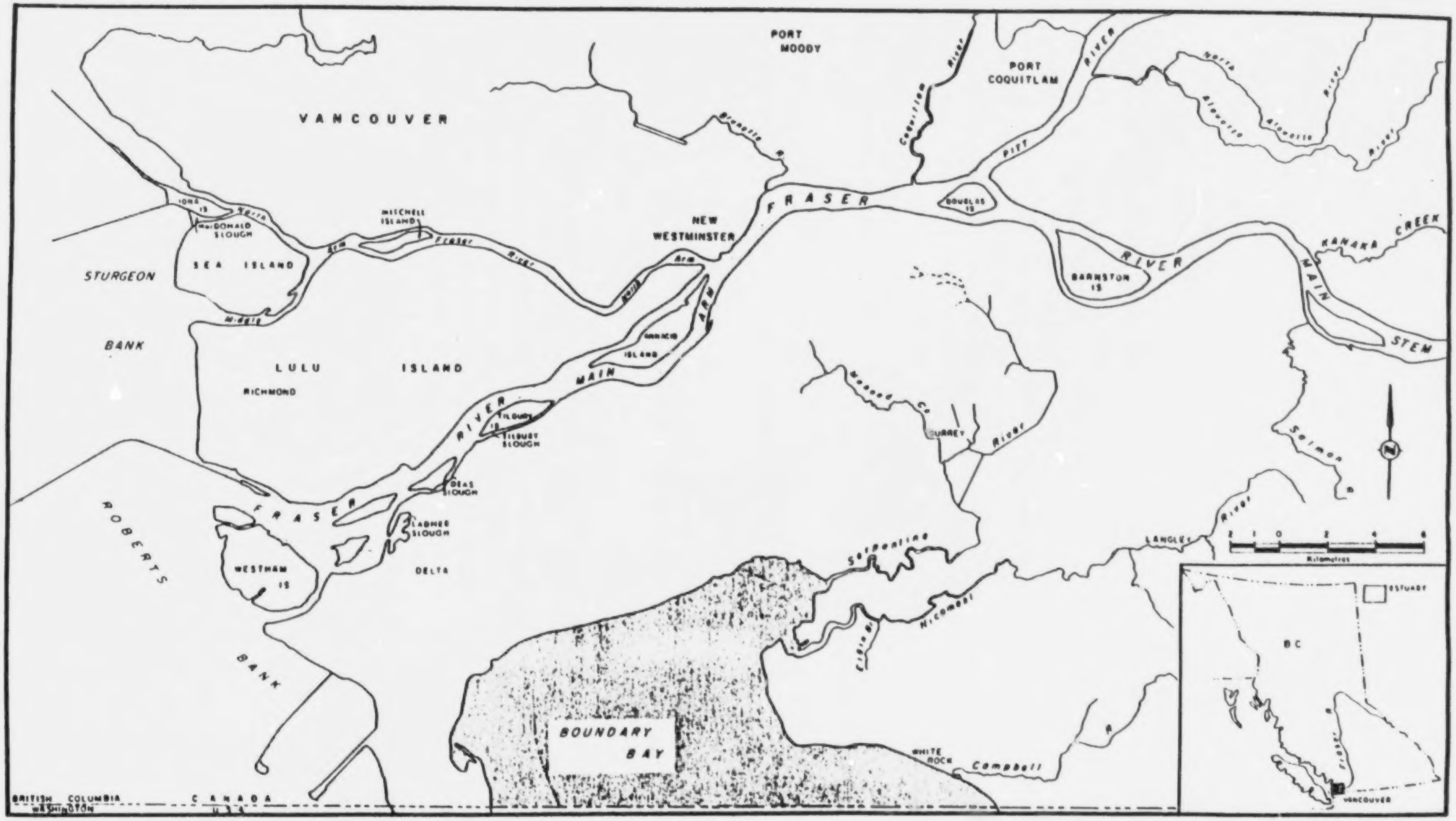
FRASER RIVER ESTUARY MANAGEMENT PROGRAM

The Fraser River estuary extends east to Kanaka Creek and the outlet of Pitt Lake, and encompasses Boundary Bay, Semiamhoo Bay, and the waters out to the Strait of Georgia (Figure 13). It is surrounded by the greater Vancouver area, home to 1.5 million people, and currently hosts about 200 industrial companies which require access to its waters (FREMP 1991a). The Fraser River basin includes the estuary, and contains 25 percent of the province's land mass and two-thirds of its population. The river and estuary are important sources of salmon and other fish, and contribute significantly to the province's recreational opportunities, transportation network and industrial development. The health of the estuary and river basin have recently been addressed by cooperative efforts throughout all levels of government, formalized in the Fraser River Estuary Management Program and the Fraser River Basin Action Plan.

Fraser River Estuary Management Program:

The Fraser River Estuary Management Program (FREMP) has been in existence since 1985. The program was renewed for the 1991-1994 period. The stated goal of the Fraser River Estuary Management Program is "to provide the means for accommodating a growing population and economy while maintaining the quality and productivity of the Fraser estuary's natural environment" (FREMP 1991a). The program emphasizes "coordinated and cooperative policies and programs for estuary management," and is based on a "linked management concept which focuses on strengthening the linkages among existing agencies rather than creating new agencies" (FREMP 1991a). Sponsors

Figure 13:
The Fraser River Estuary (from FREMP 1991a)



PORT MOODY
PORT COQUITLAM
VANCOUVER
NEW WESTMINSTER
FRASER
RIVER
MAIN STEM
KANAKA CREEK
BARNSTON IS
DOUGLAS IS
Pitt River
Coquitlam River
North Alouette River
Alouette River
Brunette R.
IONA IS
North Arm
MITCHELL ISLAND
Fraser River
McDONALD SLOUGH
SEA ISLAND
Middle Arm
STURGEON BANK
LULU ISLAND
RICHMOND
ANNACIS ISLAND
MAIN ARM
TILBURY IS
TILBURY SLOUGH
DEAS SLOUGH
LADNER SLOUGH
DELTA
WESTHAM IS
ROBERTS BANK
BOUNDARY BAY
Serpentine
Nicomekl
Campbell
WHITE ROCK
SURREY
Bear Cr.
River
Salmon R.
LANGLEY
Kilometres
2 1 0 2 4 6
N
BC
ESTUARY
VANCOUVER
BRITISH COLUMBIA
WASHINGTON
CANADA
U.S.A.

of the program include the B.C. Ministry of Environment, Lands and Parks, Environment Canada, Fisheries and Oceans Canada, the Greater Vancouver Regional District, and the North Fraser (NFHC) and Fraser River Harbor Commissions (FRHC).

The management structure for FREMP in the 1991-1994 renewal period consists of a Management Committee and three technical committees, assisted by an Advisory Committee and Secretariat. The Management Committee is comprised of representatives from federal, provincial, regional, and port governing bodies. The three technical committees are the Water and Land Use Committee, the Water Quality/Waste Management Committee, and the Environmental Review Committee. The Advisory Committee is proposed to consist of the Technical Advisory Committee of the Greater Vancouver Regional District.

As part of its efforts to coordinate activities among relevant public agencies in the estuary, FREMP developed the Coordinated Project Review Process. Any proposed development project in the estuary is referred by the receiving agency to the publicly accessible Central Project Registry in the FREMP Secretariat Office. This registry sends proposals or permit applications for review to the appropriate agencies. An environmental review committee comprised of federal and provincial environment and fisheries agencies gathers the comments and meets regularly to prepare a single coordinated response. The responses are sent to a designated lead agency, such as the Harbor Commissions or Ministry of Environment, Lands and Parks, where they are incorporated into shoreline leases and construction approvals (FREMP 1991a).

A draft copy of a report put out by the Fraser River Estuary Management Program lists 50 proposed activities to be considered as part of an action program for the 1991-1994 period. These activities relate to port and industrial development, navigation and dredging, log management, waste management, recreation, habitat protection and environmental emergencies. The program's Technical Committees are responsible for incorporating these recommendations into implementation plans for the estuary. Such plans include a comprehensive habitat preservation plan, a regional port and industrial development strategy, a recreation plan, and a water quality plan (FREMP 1991a). Elements of these reports are being implemented. In June of 1991 the signatory federal and provincial agencies pledged a total of $600,000 to be spent under the program during a three year period (Govmt. of Can. 1991).

FREMP Contact:
Michael McPhee
Fraser River Estuary Management Program
(604) 525-1047

Fraser River Basin Action Plan:

In June of 1991, the federal government announced the components of its Fraser River Basin Action Plan. Developed as an element of Canada's Green Plan, the federal government pledged $100 million over the next six years to "clean up British Columbia's Fraser River, return salmon populations to historic abundance and restore the river to environmental health" (Govmt. of Can. 1991). One long-term objective of the plan is to double the sockeye salmon population in the river over the next twenty years. Elements of the plan include:

- identification and reduction of contaminants entering the river, including urban/agricultural runoff, air, groundwater, and waste sites ($9.5 million);
- enhanced enforcement of environmental regulations, encouragement of public participation in reporting, and strengthened laboratory support ($10.6 million);
- restoration of habitat along the basin and rehabilitation of salmon populations ($30 million);
- identification of toxics in the basin and sources of contamination; development of an information base to address them and prevent future pollution problems ($18.3 million);
- support of research projects that have an ecosystem approach, for example, the effects of logging on salmon ($14 million);
- encouragement of projects that demonstrate sustainable development, such as habitat restoration ($11 million);
- integration of fisheries uses with other resource users in the basin in order to develop sustainable development strategies for all resource users, for example sustainable agriculture ($10.6 million); and
- development of a Burrard Inlet environmental action plan ($4 million). (Excerpted from Green Plan Media Backgrounder)

The federal government expects to provide leadership on the implementation of these objectives through Environment Canada and Fisheries and Oceans Canada. Although a federal initiative, the Action Plan builds on the existing Fraser River Estuary Management Program and relies on the continued cooperation of provincial, regional, and port governments as well as industry and the public.

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Chris Pharo
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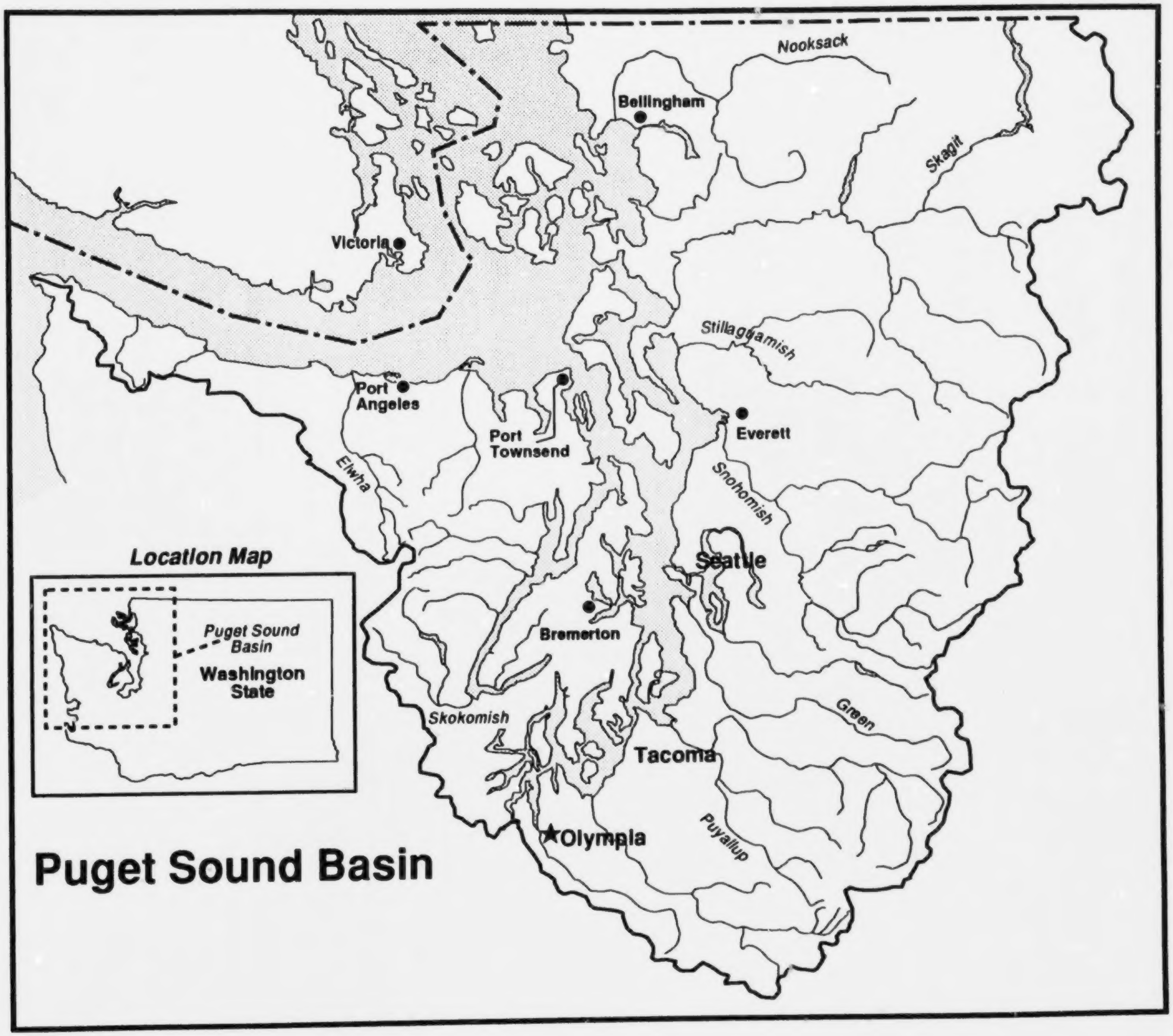
PUGET SOUND WATER QUALITY MANAGEMENT PLAN

The purpose of the Puget Sound Water Quality Management Plan is to "restore and protect the biological health and diversity of Puget Sound. The strategy for achieving this purpose is to protect and enhance the Sound's water and sediment quality; its fish and shellfish; and its wetlands and other habitats" (PSWQA 1990b). The area addressed in the plan, as defined by the Washington State legislature, includes Puget Sound south of Admiralty Inlet, the waters north to the Canadian border, the Strait of San Juan de Fuca south of the Canadian border, and all the land draining into these waters (Figure 14).

Figure 14:
The Area Addressed in the Puget Sound Water Quality Management Plan


Puget Sound Basin
Location Map
Puget Sound Basin
Washington State
Nooksack
Skagit
Bellingham
Victoria
Stillaguamish
Port Angeles
Port Townsend
Everett
Elwha
Snohomish
Seattle
Bremerton
Skokomish
Green
Tacoma
Olympia
Puyallup

The first Puget Sound Water Quality Management Plan was written for 1987, followed by plans in 1989 and 1991. In 1990, the Washington State legislature amended the Puget Sound Water Quality Authority's enabling act, calling for an extension of the Authority until 1995 and for a four-year plan update cycle following the adoption of the 1991 plan.

The 1991 Plan lists the Authority's broad-based priorities, which are as follows:

- assess the environmental conditions of Puget Sound, its resources, and the effects of human activities on them;
- clean up existing toxic contamination where sources are controlled;
- continue plan programs that have been started and maintain current funding levels;
- control sources of toxic contaminants to Puget Sound;
- enhance protection of shellfish beds;
- ensure the protection of wetlands and aquatic habitat and stop losses of wetlands and other habitats;
- improve the control and cleanup of nonpoint source pollution;
- prevent spills in the Sound and enhance response capability;
- provide long-term support for research and education; and
- support and improve education and public involvement programs (PSWQA 1990b).

The Puget Sound Plan also contains more specific priorities, discussed on an "element-by-element basis" in the Action Plan. The major elements of the Action Plan consist of programs concerned with monitoring; research; education and public involvement; spill prevention and response; household hazardous waste reduction; municipal and industrial discharges; wetlands and fish and wildlife habitat protection; nonpoint source pollution control; shellfish protection; stormwater and combined sewer overflows; and laboratory support (PSWQA 1990b). Implementation of the Plan's elements depends upon state, federal, local, and private funding for each specific program.

The Water Quality Authority proposes funding mechanisms, recommends new legislation as needed, and oversees the implementation of the plan. The Authority is comprised of 11 members, nine of whom are appointed by the governor. Each of the six congressional districts surrounding Puget Sound is represented by one member. In addition, cities, counties, and tribes each have a representative. The director of Ecology and the Commissioner of Public Lands or their respective designees serve as members, and each has a vote. The director of Ecology serves as the Authority's chair. An executive director, appointed by the governor, selects, supervises, and manages the work of the Authority's staff. The planning cycle for the Authority was extended to complete the next plan by July 1, 1994, coinciding with the next sunset review for the Authority.

Puget Sound was formally designated as part of the Environmental Protection Agency's (EPA) National Estuary Program in March of 1988. This designation was significant as it brought federal funding for studies, projects, planning, and problem solving, and increased federal involvement in the management of the Sound. The 1991 Water

Quality Management Plan was adopted by the EPA as the Comprehensive Conservation and Management Plan (CCMP) under the National Estuary Program in May 1991.. Designation as a CCMP indicates that federal activities in the Sound should be consistent with the elements of the Plan.

The Puget Sound Estuary Program (PSEP) is "a multi-agency group formed to promote the protection and beneficial use of Puget Sound and its resources; it is jointly chaired by EPA, Ecology, and the Puget Sound Water Quality Authority. The members of PSEP seek an integrated and consistent approach to managing the actions and events that influence the Sound" (PSEP 1991). One product of this group is the development of the Puget Sound Protocols and Guidelines, a set of methodological and analytical methods proposed to be uniformly used in environmental sampling throughout the Sound.

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I. MARINE PROTECTED AREAS

Both the U.S. and Canada have similar policies designed to protect the ecological viability of marine ecosystems. The U.S. National Oceanic and Atmospheric Administration (NOAA) is currently considering two sites in Washington State for sanctuary status-- one off of the Olympic Coast, and one in Northern Puget Sound. The proposed Northern Puget Sound Sanctuary would border on the internationally shared waters of the Straits of Georgia and Juan de Fuca, while the proposed Olympic Coast Sanctuary would reach to the international border in the Strait of Juan de Fuca. One area in British Columbia currently being studied for national marine park status encompasses the Gulf Islands in the Strait of Georgia. A biosphere reserve encompassing British Columbia's Gulf Islands and Washington's San Juan Islands was proposed by a B.C. Member of Parliament in 1991.

Canada's Green Plan promotes the establishment of three new national marine parks by 1996, as well as the designation of three other national marine parks in areas to be confirmed by the year 2000. Both the U.S. and Canadian proposed protected areas are affected by international recreational and commercial boating traffic, as well as sources of water pollution originating in Washington and British Columbia. Cooperation in addressing these issues and the possible establishment of a joint protected area represent a positive approach to managing the region's shared natural resources.

CANADA/B.C. NATIONAL MARINE PARKS

Marine protected areas in British Columbia fall under the National Marine Parks program of Environment Canada's Park Service. Under this program, jurisdiction over lands and waters are transferred from the province to Canada, with cooperative agreements common among the federal and provincial agencies involved.

Federal Marine Park System:

The National Marine Parks Policy was developed in 1986, "to protect and conserve representative examples of the diversity of Canada's coastal zone and oceans for the benefit of present and future generations" (ARCG 1987). The national marine parks normally include the seabed, its subsoil and overlying water column, together with certain coastal lands and islands. Parks which are wholly offshore may be established to protect marine areas some distance from Canada's coasts (Env. Can 1986).

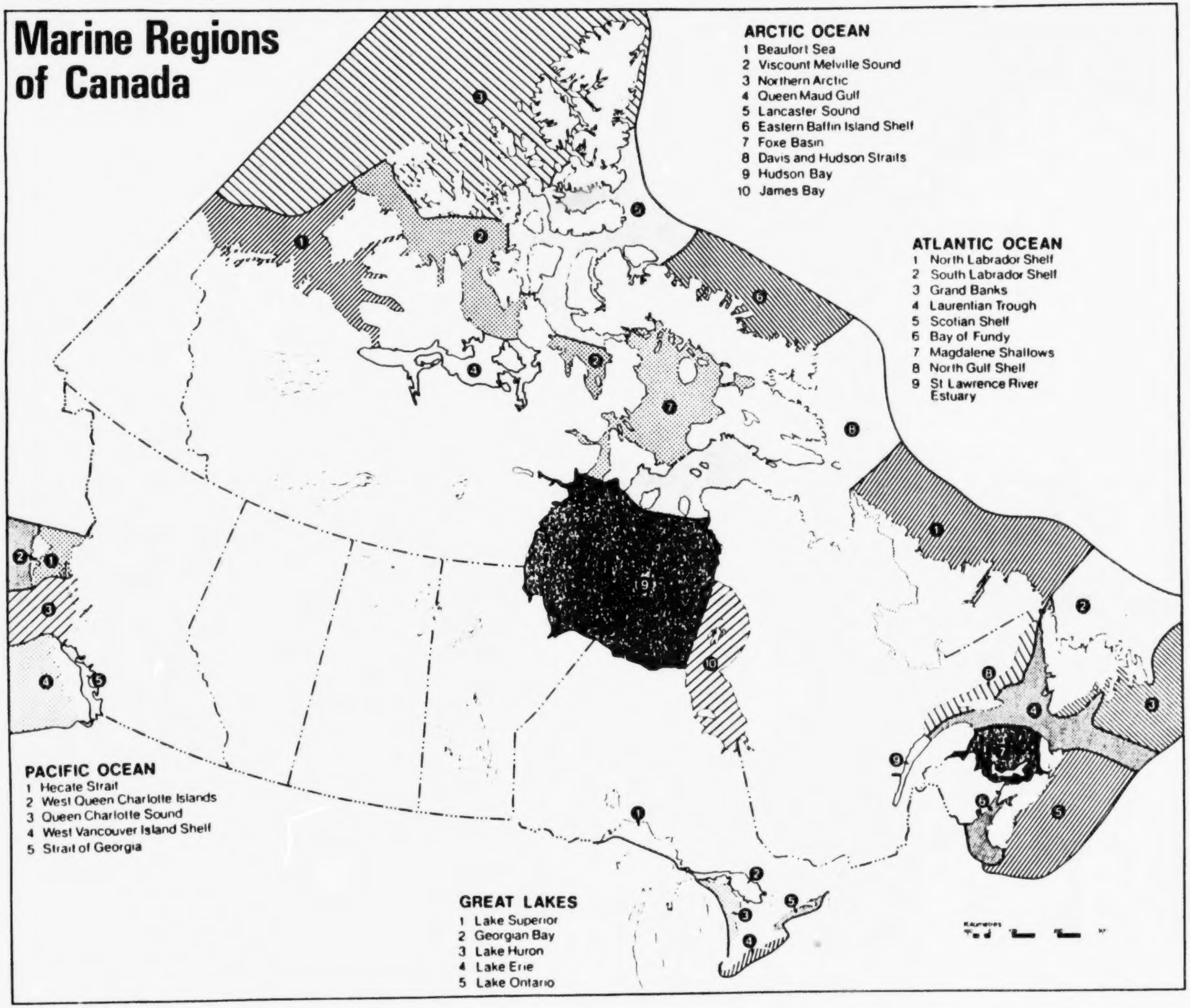
The Canadian Parks Service of Environment Canada divided the Pacific, Atlantic, Arctic, and Great Lakes into 29 geographically distinctive "marine regions," five of which are in the marine waters of British Columbia (Figure 15) (Mondor and Henwood eds. 1988). Environment Canada's long-term goal was to establish a marine park or park reserve within each of the 29 regions. As of 1991, the Canadian Parks Service has negotiated one marine park agreement in British Columbia--South Moresby/Gwaii Haanas, which lies in regions 1 and 2 of the five regions (Env Can. 1991). Parks Service officials are currently analyzing the results of a study identifying representative areas for a marine park in the Strait of Georgia (Env. Can. 1991).

National marine parks typically are owned by Canada and managed by the Canadian Parks Service under the National Parks Act of 1988. Before establishing a marine park, Environment Canada negotiates management agreements with Transport Canada, Fisheries and Oceans Canada, and the provincial ministries that may be involved. Federal court decisions establishing a "paramount public right of navigation and fishing," help to create a need for the different federal agencies to cooperate in the management of marine parks (ARCG 1987). In many cases, the province has jurisdictional domain over the area delineated as potential park land, and an agreement transferring ownership and administration to the federal government must be designed (Env. Can. 1991). In some cases, agreements with the provinces are required with respect to fisheries and water management.

Within the national marine parks, "commercial exploration, extraction, or development of non-renewable resources" is not permitted (ARCG 1987). Before establishing a marine park, Environment Canada must carry out a mineral and energy resource assessment (MERA) to assess the potential of renewable and nonrenewable natural resources in the proposed protected area (Mondor and Henwood eds. 1988).

Although navigation within the marine park may "take into account the need for essential services such as ferries and northern supply routes," access to and movement

Figure 15:
The 29 Marine Regions of Canada's National Park System


Marine Regions of Canada
ARCTIC OCEAN
1 Beaufort Sea
2 Viscount Melville Sound
3 Northern Arctic
4 Queen Maud Gulf
5 Lancaster Sound
6 Eastern Baffin Island Shelf
7 Foxe Basin
8 Davis and Hudson Straits
9 Hudson Bay
10 James Bay
ATLANTIC OCEAN
1 North Labrador Shelf
2 South Labrador Shelf
3 Grand Banks
4 Laurentian Trough
5 Scotian Shelf
6 Bay of Fundy
7 Magdalene Shallows
8 North Gulf Shelf
9 St Lawrence River Estuary
PACIFIC OCEAN
1 Hecate Strait
2 West Queen Charlotte Islands
3 Queen Charlotte Sound
4 West Vancouver Island Shelf
5 Strait of Georgia
GREAT LAKES
1 Lake Superior
2 Georgian Bay
3 Lake Huron
4 Lake Erie
5 Lake Ontario

within marine parks is "managed in such as manner as to furnish protection to threatened or endangered species and habitats, provide the public with opportunities to understand and enjoy the marine park, ensure public safety, and minimize conflict between commercial and recreational uses" (Env. Can. 1986).

Provincial Marine Park System:

British Columbia's Ministry of Environment, Lands and Parks manages 28 provincial marine parks. For the most part, these parks do not always encompass marine waters (they may be along the shore) and are oriented toward recreational marine users. Desolation Sound Provincial Marine Park in the Strait of Georgia does include the marine environment and most resembles a Canadian national marine park.

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U.S./WASHINGTON MARINE PROTECTED AREAS

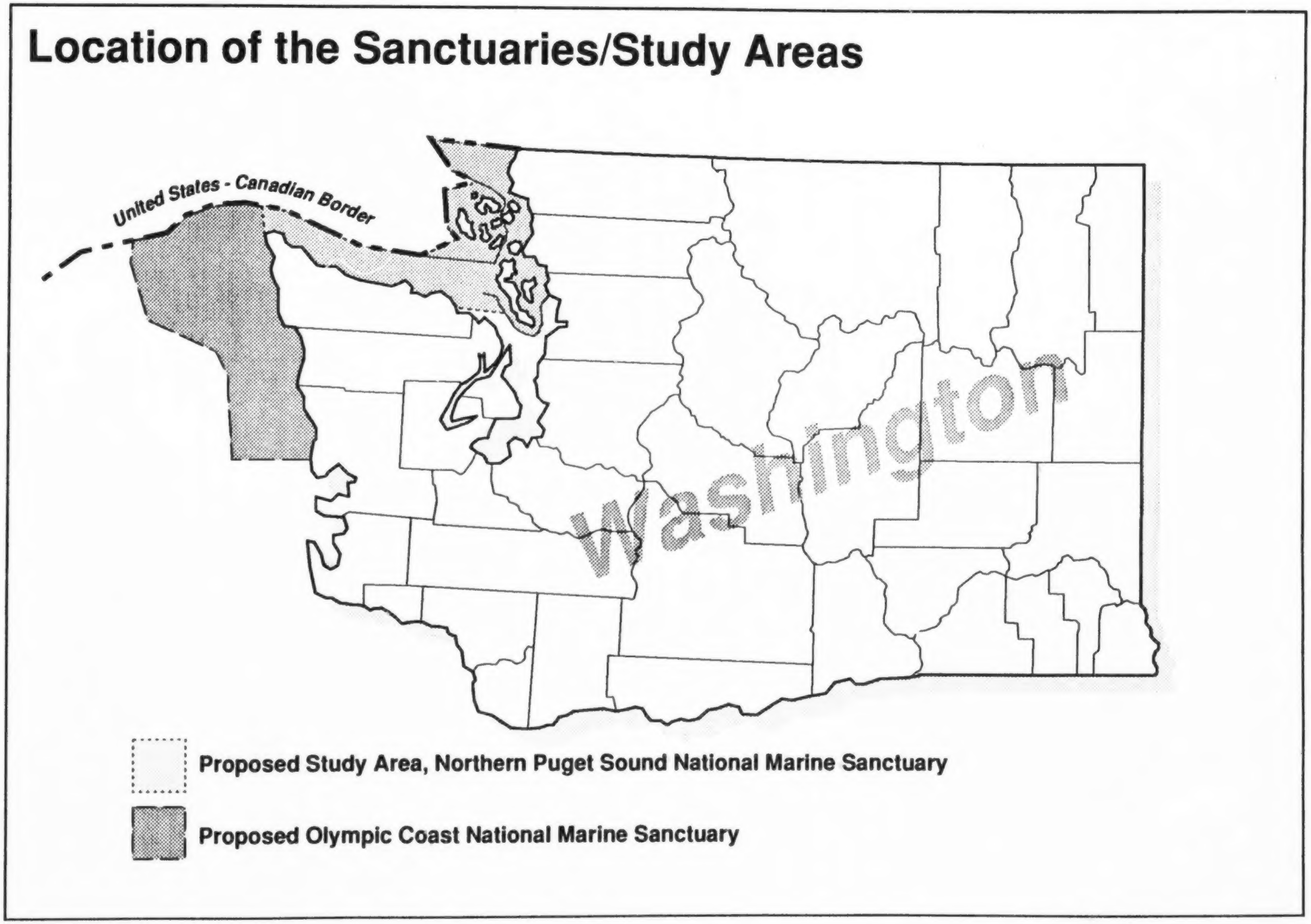
Although the Marine Sanctuary Program is the most comprehensive marine protection program in the U.S., the National Estuary Program and National Estuarine Reserve Research System are closely related and also function to protect and manage significant marine resources. These three programs will be described under this heading.

Marine Sanctuary Program:

The U.S. Marine Sanctuary Program was established in 1972 when Congress passed the Marine Protection, Research and Sanctuaries Act. The primary purpose of the Program is to "conserve nationally significant marine areas through management, research and education (CEE 1988)." The National Oceanic and Atmospheric Administration's (NOAA) National Ocean Services division carries out day-to-day operation of the Marine Sanctuary Program.

The Marine Sanctuaries Act authorizes the Secretary of Commerce, with state and local consultation, to designate and protect discrete areas of the marine environment as national marine sanctuaries. In addition to being nationally significant, these areas also have additional controls to ensure comprehensive conservation and management, including resource protection, scientific research, and public education. The designation of an area as a national marine sanctuary requires a comprehensive assessment of its marine resources and commercial and recreational uses, and makes the area eligible for special management planning under the Marine Sanctuary Program.

Figure 16:
Approximate Locations of Proposed Sanctuaries and Study Areas (not to scale)


Location of the Sanctuaries/Study Areas
United States - Canadian Border
Washington
Proposed Study Area, Northern Puget Sound National Marine Sanctuary
Proposed Olympic Coast National Marine Sanctuary

The goals of the National Marine Sanctuary Program are as follows:

- enhance resource protection through comprehensive and coordinated conservation and management, tailored to the specific resources, that complements existing regulatory authorities;
- support, promote, and coordinate scientific research on, and monitoring of, the site-specific marine resources to improve management decision-making in National Marine Sanctuaries;
- enhance public awareness, understanding, and wise use of the marine environment through public interpretive and educational programs;
- facilitate, to the extent compatible with the primary goal of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities; and
- identify areas of the marine environment of special national significance due to their natural resource or human-use values (NOAA 1991).

Multiple-Use is maximized as long as it is consistent with the primary purpose of preservation. In this regard, commercial and recreational fishing, shipping, and oil and mineral exploration and extraction are allowable in a marine sanctuary.

Under Congressional legislation, NOAA is currently discussing with the state the possibility of designing a national marine sanctuary in the waters of Puget Sound. The proposed Northern Puget Sound Sanctuary (Figure 16) is currently in the study phase, which includes determining possible sanctuary boundaries, drafting an environmental impact statement and management plan, and assessing the need for regulation (PSWQA 1990b). The study area boundaries encompass an area that is most likely larger than what the proposed sanctuary might encompass. A second proposed sanctuary, the Olympic Coast National Marine Sanctuary (Figure 16) is further along in planning than the Puget Sound Sanctuary, and is currently undergoing NEPA review.

National Estuary Program:

Upon the request of a state governor, the U.S. Environmental Protection Agency may designate an estuary as being of national significance under Section 320 of the Clean Water Act. Designated estuaries are not necessarily pristine, but might be threatened by pollution, development, and overuse. A National Estuary designation entitles that estuary to federal money and assistance in the preparation of a comprehensive management plan. Puget Sound has been included in the National Estuary Program since 1988, and the Puget Sound Water Quality Management Plan was recently accepted by the EPA as the National Estuary Program's first Comprehensive Conservation and Management Plan.

EPA's Region 10 office in Seattle and the involved state agencies formed a management committee consisting of numerous work groups to assess water quality and habitat problems, identify management solutions, and develop and oversee implementation of plans for addressing the problems. In Puget Sound, a technical advisory committee (which includes Canadian scientists) was also formed to address scientific and technical issues.

National Estuarine Research Reserve System:

The federal Coastal Zone Management Act of 1972, as amended, provides for a National Estuarine Research Reserve system to establish and manage, through federal-state cooperation, a national system of estuarine reserves representative of the 27 coastal biogeographic regions and estuarine types in the U.S. and its territories. At present, the system includes over 275,000 acres of estuarine waters, wetlands, and intertidal areas at 20 different sites. Portions of Padilla Bay, in Puget Sound, form one such National Estuarine Research Reserve. Throughout the reserve system, the purpose of designation and management is the long-term protection of the estuarine resource as a natural field laboratory for research, monitoring, and interpretive/educational programs, all directed at improved coastal management.

The overall reserve system is managed and partially funded by NOAA. The Padilla Bay reserve is managed by the Shorelands and Coastal Zone Management Program within the state's Department of Ecology.

Federal Contact:
Marine Sanctuaries
Linda Maxson
Marine Sanctuaries and Reserves
NOAA
(206) 526-6304

Puget Sound Estuary Program
Jack Gakstatter
Office of Coastal Waters
U.S. EPA
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State Contact:
National Estuarine Research Reserves
Terry Stevens
Padilla Bay National Estuarine Research Reserve
Department of Ecology
(206) 428-1558

PART VIII. WATER QUALITY MONITORING

Monitoring can provide information on the environmental health of a water body, and can indicate the success or failure of pollution controls and regulations. While monitoring requirements can be included in a regulation or permit, monitoring generally falls under the scientific and technical realm of environmental management, as well as under the regulatory sphere. Monitoring ideally represents a means of internationally sharing information to help improve environmental management decisions on both sides of the border. For these reasons, this report addresses monitoring separately.

Environmental monitoring refers to the regular sampling over time of specific variables in designated areas or in biological populations. It is not to be confused with environmental sampling, which occurs irregularly. Monitoring of a body of water, its sediments and its biota can help clarify the ways that an ecosystem works and can help with the assessment of environmental conditions, natural resources, and the effects that human activities have upon them (PSWQAa 1991). For chemical analyses, monitoring data "identify the contaminants of concern, the areas of higher concentration, and the areas of synergistic or additive effects for which remedial actions are required" (FREMP 1990b).

Ambient monitoring helps describe the background qualities of a waterbody, while monitoring at an effluent source is primarily used by environmental regulators to assess whether dischargers are in compliance with permits. In both British Columbia and Washington, a number of agencies regularly sample or monitor effluent discharges, and long-term, ambient monitoring programs exist in the Fraser River Estuary, Puget Sound, and select freshwater bodies. In some instances, monitoring programs in both the state and province follow similar protocols and guidelines.

A. CANADA/B.C WATER QUALITY MONITORING

Environment Canada and B.C. Environment, Lands and Parks have cooperative ambient monitoring programs in the Fraser River Estuary and in some transboundary freshwater bodies. For the most part, monitoring programs are lacking in British Columbia's marine waters, but have been developed for some of the province's freshwater bodies. Formal protocols have not been published by the province, but exist through contract agreements with the laboratories that analyze the province's environmental samples. Environmental monitoring often is required as a condition in permits issued under the British Columbia Waste Management Act, pursuant to regulations.

Federal Programs:

Environment Canada and Fisheries and Oceans Canada share responsibility for monitoring marine water quality. Environment Canada has authority to coordinate federal policies and programs concerned with environmental quality (including the marine environment), and is the protector of endangered species, migratory birds, and their habitats. Fisheries and Oceans Canada has a mandate to "coordinate government programs respecting oceans and marine science" and has statutory responsibility for the management of fish and marine mammals (Harding 1991). Apart from specific environmental sampling programs (eg. dioxin program), Fisheries and Oceans Canada concentrates on monitoring shellfish products for bacterial contamination, and monitoring fish stocks and marine mammal populations. In addition to research into the effects of pollutants on fish and fish habitat, the Science Branch of the Department of Fisheries and Oceans also "monitors" physical oceanographic parameters such as temperature and density.

Environment Canada's Conservation and Protection has collected data on contaminants in sediment and biota at about fifty locations along the B.C. coast. These sites include ocean dump sites and some of the major outfalls, as well as baseline (non-polluted) areas. Data collected from these sites vary according to the objectives of individual programs, the analytical and sampling protocols, and the sampling frequencies. This lack of coordination among sampling programs makes it difficult to compare data between sites (Harding 1991) or to analyze trends over time (Kay 1989).

Conservation and Protection monitors bacterial quality of shellfish growing water at numerous stations in commercial growing areas. Pursuant to an international agreement between the U.S. and Canada, sampling and analytical protocols for shellfish bacterial analyses are comparable to the U.S. The Canadian Wildlife Service monitors contaminants in seabird eggs at selected colonies. These two monitoring programs (bacteria and seabird eggs) are, however, among the few federal programs carried out regularly (Wells and Rolston 1991).

As participants in the Fraser River Estuary Management Program (FREMP), Conservation and Protection and the Department of Fisheries and Oceans have established sediment sampling stations at irregular intervals along the Fraser River plume, to monitor contaminants settling from the Fraser river (Harding 1991). Fisheries and Oceans Canada and Environment Canada are also members on the Burrard Inlet and Columbia River coordinated monitoring program committees directed at assessing current levels of contamination and source control technologies.

Provincial Programs:

The provincial waste discharge permits issued by B.C. Environment, Lands and Parks require many point source dischargers to monitor their effluent and adjacent environs, especially if the discharges may threaten a federally managed resource. Examples of this type of monitoring particularly relevant to Washington state are the environmental monitoring programs at Greater Vancouver's Iona and Victoria's sewage treatment outfalls (Harding 1991).

Through a cost-share agreement with Environment Canada, B.C. Environment, Lands and Parks conducts its ambient freshwater monitoring program, and collects data from transboundary freshwater stations on the Similkameen, Columbia, and Okanagan rivers in the interior part of the Province. This federal/provincial agreement establishes protocols for collection and analysis. In fact, all data collected by the Ministry are generated by one contract laboratory, which has established methods that can only be changed upon consultation with B.C. Environment, Lands and Parks.

The provincial government generally does not have jurisdiction over marine resources and thus does not intensively monitor them. As part of its water quality program, however, B.C. Environment, Lands and Parks regularly samples sites in Vancouver Harbor, the Fraser Estuary, Kitimat Estuary and other important bodies of water to determine whether water quality objectives are being met. At other water bodies throughout the Province where objectives have been developed, B.C. Environment, Lands and Parks samples water quality for three years and then assesses whether monitoring should continue. The substances sampled and information sought vary among sites.

In 1986, a five year agreement between the Fraser River Harbor Commission and B.C. Environment, Lands and Parks established a sampling program in the Fraser River Estuary area. This agreement was recently renewed for a further five years. Through the program, B.C. Environment, Lands and Parks sampled major effluent discharges, sediments and contaminants in the Fraser River, and completed a study of contaminants in Boundary Bay's sediments, fish and other biota (FREMP 1990a). The Puget Sound protocols and guidelines (see U.S./WA discussion) were the analytical protocols used in the studies conducted under the Fraser River Estuary Monitoring project (Swain 1990). FREMP is also developing a coordinated monitoring program for the Estuary.

In British Columbia, no studies have been published on the effects of pollutants on marine mammals. Agencies in the province do not regularly sample for contaminants in salmon (two recent ad hoc assessments of contaminants in returning Fraser River Sockeye Salmon showed low to nondetectable levels of metals and selected organics in the flesh), and have no regular monitoring program for contaminants in groundfish and invertebrates caught in Canadian waters and sold in local markets (Wells and Rolston 1991).

According to one publication by Environment Canada, in the Pacific marine environment "the shortage of long-term monitoring programs precludes establishing many trends in environmental quality. Marine quality indices are largely absent, except for bacterial standards for shellfish growing waters, residue and effects data for birds and fish, and guidelines for some chemical contaminants in fish products for human consumption" (Wells and Rolston 1991).

To address this shortfall, Environment Canada is drafting a proposal to establish a national marine status and trends network with other federal and provincial agencies. The Puget Sound Protocols and Guidelines are currently being used in part by the BC/Harbor Commission Fraser River Estuary Monitoring project and are also being considered in the development of national environmental effects monitoring requirements for the pulp and paper industry (Harding 1991).

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Provincial Contact
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B. U.S./WASHINGTON WATER QUALITY MONITORING

The U.S. National Oceanic and Atmospheric Administration (NOAA) collects monitoring information from around the nation to analyze environmental trends and the status of the environment. Other federal contributions to monitoring are done in conjunction with state programs, such as through the Puget Sound Dredged Disposal Analysis or the development of the Puget Sound Protocols and Guidelines. The Puget Sound Ambient Monitoring Program represents a cooperative monitoring effort between state and other governmental agencies, businesses, industry, and the public.

Federal Programs:

NOAA monitors through two major efforts under the National Status and Trends Program. Since 1986, the Mussel Watch Program has annually sampled eleven stations in Puget Sound for toxic chemicals in mussels (Mytilus edulis), including PAH, pesticides, and PCB congeners. The Benthic Surveillance program monitors the bottomfish and sediment for the same variables as mentioned above for mussels (excluding PAH in bottomfish). Some sampling and analyzing protocols differ from the Puget Sound Protocols and Guidelines.

The federal and state managers of the Puget Sound Dredged Disposal Analysis program (see Part VII, Dredging) need three types of information: the sediment contamination of disposal sites, the levels of contamination of sediments to be disposed of on those sites, and monitoring information at the disposal sites after dumping. Consistent with the Puget Sound Protocols and Guidelines, the four biological indicators used by PSDDA to obtain this data are amphipod tests, larval sediment tests, the benthic infaunal index, and Microtox tests. Chemical analysis under PSDDA includes the measurement of conventional sediment parameters. Chemical testing, when required for dredging permits, generally involves analysis for 58 chemicals of concern.

State Programs:

Water compliance monitoring is conducted by some point source discharges, and submitted by the discharger to Ecology. Ecology uses the monitoring information to determine whether the discharger is in compliance with the terms of its permit. By 1992 some permitted dischargers will be required to monitor conventional and toxic pollutants in the water column, monitor sediments, and conduct tests determining the effects of the discharge on the biota.

Ecology may also carry out intensive surveys for problem-specific water bodies to determine whether a water quality problem exists and how it can be ameliorated. The number of intensive surveys carried out depends upon funding and varies annually. Ecology currently monitors the Alpine Lakes (in the Cascade Mountains) for a long term acid deposition study.

The Office of Shellfish Programs of the state's Department of Health "monitors the water quality of the commercial shellfish growing areas in the state, and classifies these areas based on the water quality results and pollution source evaluations" (DOH 1991). Under this program, in 1990, some shellfish harvest areas were sampled near the international border (e.g. Birch Bay, Georgia Strait, Drayton Harbor) for bacterial contamination and paralytic shellfish poisoning (DOH 1991). The Office of Shellfish Programs also participates in the Puget Sound Ambient Monitoring Program, described below.

The Northwest Indian Fisheries Commission (NWIFC) and its member tribes carry out numerous monitoring programs in both fresh and salt waters, focusing on fish habitat, water quality, fish stock assessments, shellfish abundance, bacterial content, and temperature in streams.

Freshwater ambient monitoring programs in Washington involve sampling from rivers, lakes, and marine waters. Samples are collected monthly from an estimated eighty stations on the state's rivers. From these stations, field measurements (for temperature, pH, conductivity) are taken by Ecology staff, and the water is sampled for bacteria, nutrients, suspended solids, turbidity, and metals. Among these eighty stations are core stations (monitored "in perpetuity"), rotating stations (monitored every three years), and floating stations (sampled to address a special need).

Ecology also has a Citizen Monitoring Program for Lakes, through which about fifty lakes are monitored using a secchi disk. Nutrients may be collected, and (with available funding), Ecology staff may take additional measurements (e.g. water column profiles).

The marine waters of Willapa Bay and Grays Harbor are sampled monthly by float plane for salinity, pH, temperature, conductivity, and water column profiles. The mouth of the Columbia is not monitored. The waters of Puget Sound are monitored through the Puget Sound Ambient Monitoring Program, described below.

Puget Sound Ambient Monitoring Program (PSAMP):

An ambient monitoring program was called for by the legislation that created the Puget Sound Water Quality Authority and is a major element in the 1991 Puget Sound Water Quality Management Plan. Implementation of the Puget Sound Ambient Monitoring Program (PSAMP) was added to the Authority's enabling legislation in 1990. The program began field sampling in 1989. Six state agencies carry out the program, with the support of other government agencies, businesses, industry, and the public.

PSAMP is a comprehensive, long-term monitoring program for measuring ambient, or background conditions in Puget Sound, as well as the cumulative effects of contamination and habitat degradation from many individual human actions. Strong coordination will ensure that PSAMP collects data that are useful to water quality and natural resource managers, in a cost effective manner over time (PSWQA 1991a). A summary report of the PSAMP findings is published annually, as are technical reports from each element of the PSAMP. Copies of these documents can be obtained from the Puget Sound Water Quality Authority at (206) 493-9300.

The eight different elements monitored under PSAMP are discussed below. Special mention is made of monitoring stations located near the Canadian border and cooperative sampling efforts between the province and state are discussed where appropriate (PSWQA 1991a).

PSAMP Fisheries: The PSAMP design concentrates on measuring contaminant levels in fish, the effects of contaminants on the fish, and the potential effects to humans who eat the fish (PSWQA 1991a). PSAMP fish monitoring examines English sole for liver disease and measures tissue contaminant levels. The program also measures contaminants in copper and quillback rockfish, chinook and coho salmon, and Pacific cod. During 1989-1991, fish were analyzed for cooper, arsenic, lead, and mercury and for many organic compounds including PCB's and pesticides. Near the international border, English sole were collected south of Point Roberts.

Contacts: Sandie O'Neill, Washington Department of Fisheries, (206) 545-6530; or Chris Prescott, PSWQA, (206) 493-9300

PSAMP Waterfowl: Under the original PSAMP design, the Department of Wildlife measures population abundances of marine birds and waterfowl, In the future, PSAMP will also examine the reproductive success and accumulation of toxic chemicals in marine birds and waterfowl. During 1989-1991, funds were not available to carry out the Waterfowl section of the program, but this PSAMP activity has now been funded and will begin in 1992. Historically, Wildlife surveys waterfowl populations and intensively surveys brants, dabbling and diving ducks, and snowgeese between Port Susan Bay and Boundary Bay. The Washington Departments of Wildlife and Fisheries and the Canadian Wildlife Service cooperatively survey Snow geese. Information on trumpeter swans and brants is also shared between B.C. and Washington. The U.S. Fish and Wildlife Service is also collecting information on waterfowl and marine birds in Puget Sound.

Contact: Don Kraege, Washington Department of Wildlife, (206) 586-2758

PSAMP Shellfish: Under PSAMP, the Washington Department of Health (DOH) samples for paralytic shellfish poisoning (PSP) every other week for six months of the year, and samples once a month between October and March. PSP is measured at over 100 beaches throughout the Sound, and investigators select 16 of these that are consistently sampled throughout the year for PSP trend analysis (PSWQA 1991a). In 1990, one of these locations was near Blaine. Beginning in 1989, DOH investigators sampled bivalves (native littleneck clams, manila clams, butter clams, and blue mussels) for bacterial contamination at recreational beaches, one site was in the San Juan Islands. Investigators also sampled shellfish for chemical contamination on three beaches believed to be potentially polluted by nearby urban sources, including Post Point.

Contact: Linda Klote, Washington Department of Health, (206) 586-8736.

PSAMP Marine Mammals: The PSAMP design calls for monitoring the abundance and reproductive success of marine mammal populations, and tracking chemical toxicant levels in their tissue. The legislature did not allocate funds for this program during 1989-1991, thus there was no routine collection or analysis of marine mammal tissue (PSWQA 1991a). This PSAMP activity has been partially funded and will begin in 1992. The Washington Department of Wildlife has been surveying population size and reproductive rates of harbor seals, some near Boundary Bay and the San Juans.

Contacts: Don Kraege, Washington Department of Wildlife, (206) 586-2758; or Steve Jeffries, Washington Department of Wildlife, (206) 964-7278.

PSAMP Nearshore Habitat: Between 1989-1991 no funds were available for this element of PSAMP monitoring, which calls for an inventory of the estuarine nearshore habitat of the Sound. The program design was based on a remote sensing, aerial mapping project. This PSAMP activity has been partially funded and will begin in 1992. Despite the lack of funding in the past, the Department of Natural Resources has continued to work with an aircraft based scanner to update the baseline of the National Wetlands Inventory by monitoring the nearshore, beaches, and salt marshes.

Contact: Tom Mumford, Department of Natural Resources, (206) 753-3703.

PSAMP Freshwater: PSAMP design calls for sampling conventional pollutants and metals at 75 freshwater stations in the Puget Sound basin. These data are collected by the Department of Ecology and will show trends in river water quality and sediment loading over time. Such information will allow managers to estimate pollutant risk to nearshore resources and take appropriate watershed actions. Because this program was only about 20% funded during 1989-1991, only conventional pollutants at a limited number of stations were sampled, none near the international border. Ecology regularly measures the water quality of 10 major rivers for conventional water quality variables like temperature, dissolved oxygen, suspended sediment, and fecal coliform.

Contact: Dave Hallock, Department of Ecology,(206) 586-5336.

PSAMP Marine Water Column: In this part of the PSAMP, the Sound's waters are sampled for temperature and salinity, dissolved nutrients and oxygen, chlorophyll and fecal coliform bacteria. In the first phase of the program Ecology samples a limited number of open-water stations once a month, in order to evaluate long-term water quality trends. The second phase looks at areas with known or suspected quality problems. The third phase of PSAMP involves "solstice monitoring," where for two weeks on either side of the winter and summer solstices Ecology looks at the total amount of phytoplankton produced, and analyzes samples taken for dissolved nutrients, algal populations, and sunlight (incident radiation). Ecology sampled 24 stations monthly during 1989-1990, and the second and third phases have been partially funded. One sampling site is located north of the San Juan Islands, on the Canadian/U.S. border.

Contact: Carol Jantzen, Department of Ecology, (206) 586-5495.

PSAMP Sediment/Benthic Community: Under PSAMP design, Ecology annually samples at a total of 50 stations, 32 of which are permanent, 18 of which rotate over a three year cycle. Ecology samples the benthic invertebrate community as well as metals and organics (including PCB's and pesticides). The sediment bioassays used are tests for mortality using an amphipod; tests for abnormal embryonic development using bivalve (oyster or mussel) larvae; and tests for changes in cell physiology using a luminescent bacterium (Microtox tests). Due to limited funding in 1989, investigators used only amphipod and Microtox tests for bioassays, and in 1990 used only the amphipod test. Some effort at coordinating data collection with the province has been made in the form of state invitations to observe the sediment sampling process, but weather conditions prevented the meeting from occurring. In 1992 Ecology will sample from three newly placed monitoring sites within the Fraser River plume, to detect whether a noticeable gradient from the river into U.S. waters exists.

Contact: Pete Striplin, Department of Ecology, (206) 753-2835.

Puget Sound Protocols and Guidelines:

As the Puget Sound Ambient Monitoring Program (PSAMP) was being developed, a companion effort was initiated by the U.S. EPA to insure that the environmental data collected under PSAMP were of a high and consistent quality. This secondary effort produced the Recommended Protocols for Measuring Selected Environmental Variables in Puget Sound (PSEP 1991). This "Protocols Manual" was developed through a series of technical workshops on each of thirteen topics. These workshops were well-attended by scientists and covered issues like organic chemical analysis of sediment, trawling for fish and conducting sediment bioassays.

All programs and individuals collecting information in Puget Sound are encouraged to use these protocols whenever possible. The net result of the protocol development process has been that the PSAMP and other studies are now using similar protocols and the data being gathered under PSAMP can be greatly enhanced and expanded by including the data from many of the smaller data collection efforts in the Sound (i.e. permit monitoring, short term studies, monitoring by aquaria, universities and aquaculture facilities). The Protocols will be maintained and updated by the Puget Sound Water Quality Authority beginning in 1992.

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State Contact:
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PART IX. ENVIRONMENTAL REVIEW PROCESSES

A variety of environmental review processes have been adopted in the U.S. and Canada to address the environmental implications of proposed government activities and major private projects. These review processes offer a chance for governmental agencies as well as concerned members of the public to comment on proposed activities that may affect the environment. In Washington, a review process for federally sponsored activities exists, as does one for projects sponsored by state or local government. The state also has a coordinated review process for major (nonhydro) energy projects. In British Columbia, several review processes exist that specifically apply to energy projects, mining projects, major provincial projects, and projects where a federal agency has a decision-making authority or is a proponent.

Currently, the review process in Washington incorporates public comment more completely than do the provincial and federal processes in British Columbia. However, both the Canadian federal Environmental Assessment and Review Process (EARP) and the provincial review processes are undergoing revisions which should enhance public input in permit approvals and disapprovals.

The opportunities for public comment in either nation's review processes may provide openings (if the proposed opportunity for input is publicized) for citizens or government officials on either side of the border to formally comment on proposed activities that may have transboundary impacts. Environmental reviews can thus serve as established methods for promoting communication between different governments and invoking cooperative efforts toward resolving transboundary environmental problems.

One formal effort at addressing projects with transboundary impacts is the International Convention on Environmental Assessment in a Transboundary Context, signed by the U.S. and Canada under the auspices of the United Nations Economic Commission for Europe (UNECE). Specific types of projects, including groundwater extraction, mining, and port development, would be subject to the provisions of the convention, which would include assessments of the international environmental and social impacts of the proposed projects. As of September 1991, neither the U.S. nor Canada had ratified the convention, and it is unclear how and whether the provisions will be implemented.

While many avenues for review and public comment on proposed activities exist in both British Columbia and Washington, the following discussion summarizes the most major environmental review processes currently used, and highlights available avenues for public comment.

A. CANADIAN FEDERAL REVIEW PROCESSES

The following discussion summarizes the federal EARP process, the most significant environmental review processes involving the federal government in British Columbia. Two review processes which involve coordination and participation between federal and provincial agencies are discussed in Section B.

The Federal Environmental Assessment and Review Process (EARP):

The federal Environmental Assessment and Review Process (EARP) was first established in 1973. It was strengthened and updated in 1984 with the introduction of the Environmental Assessment and Review Process Guidelines Order. Originally, the process came into play when a federal entity intended to undertake a proposal of its own, or when a project occurred on lands administered by the federal government, required federal financial commitment, or involved a significant federal decision-making responsibility due to its effects on federal resources (FEARO 1987).

Court decisions since 1988 have interpreted the EARP guidelines to apply to all projects over which the federal government has any kind of decision making authority. These decisions have greatly expanded the federal government's role in reviewing proposals. Legislation is currently being considered in Parliament to clarify the federal government's mandate in this realm, but review responsibilities will most likely still be broader than under the 1984 Guidelines Order.

The Federal Environmental Assessment Review Office (FEARO) in Ottawa administers the process for eastern and central Canada, while the Western and Northern Regional Office, located in Vancouver, B.C., administers the process for the territories, British Columbia, and Alberta. FEARO receives administrative support from Environment Canada but maintains an independent relationship with the department. The federal government actively works to coordinate review activities with the provinces and territories, and every effort is made to minimize or eliminate duplication of review procedures. However, the recent Court decisions have imposed a new and added environmental assessment responsibility of federal agencies that could lead to some duplication.

The first step in the EARP is the Initial Assessment, at which point a department responsible for making a decision (the initiator) determines whether a proposal may have potential adverse environmental effects, and if so, the significance of such effects. If the initiator decides that the project may potentially have significant environmental impacts, it must develop an Environmental Impact Statement. Public consultation can be a significant part of the initial assessment process (FEARO 1987).

The project can proceed if the initiator determines that it would not produce any adverse environmental effects that could not be mitigated. If a department can not determine a proposal's environmental effects without further study, the proposal must go through a more detailed examination called an Initial Environmental Evaluation (IEE). After a decision has been made regarding the IEE, the information is made available to the public, members of which have an opportunity to respond before the proposal is carried out (FEARO 1987). The EARP guidelines encourage the initiating departments to seek public involvement, but this is not in any way mandatory. For the most part, if a project does not go through a review panel (see below), its review does not incorporate a great deal of public participation.

Projects deemed to have significant environmental effects or to be of great concern to the public undergo review by an independent Environmental Assessment Panel selected by the Minister of Environment. The panel review involves extensive public comment and offers a clear process for public involvement. Each initiating department has developed a list which identifies those types of proposals that are automatically referred for panel review.

The panel issues specific "guidelines" to the project proponent (whether federal agency or private corporation) which identify the parameters that must be addressed in the proponent's Environmental Impact Statement (EIS). Panels may request public comment before issuing the guidelines. Throughout the review process, all documents submitted to the panel become public information (FEARO 1980).

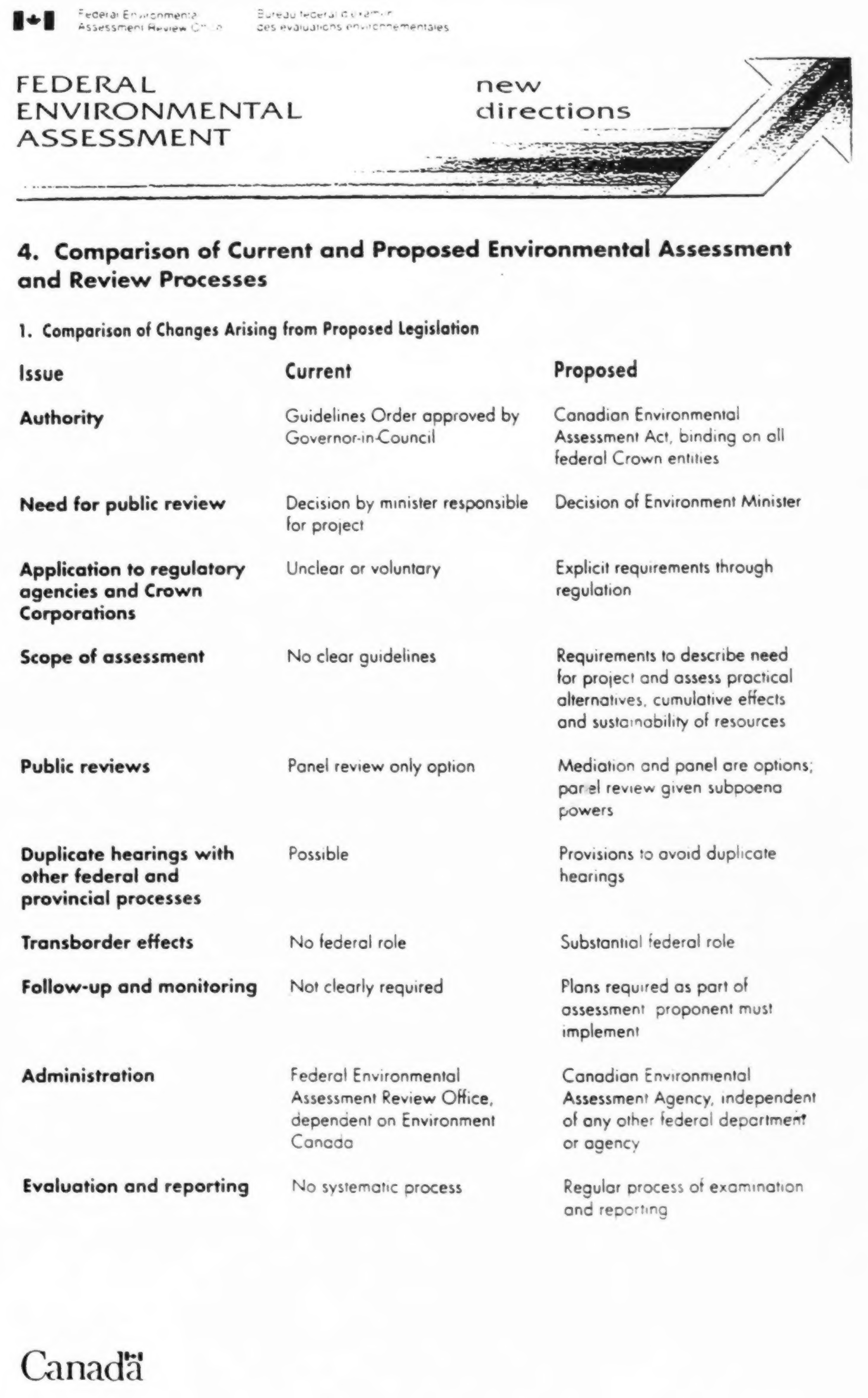
The proponent follows the guidelines and submits to the panel an Environmental Impact Statement which contains the full environmental implications of the proposal, including social and resource use impacts. The EIS identifies alternatives and indicates how adverse impacts of the proposal will be reduced or avoided. In its review of the EIS the panel consults with "experts" and the public through EIS referrals and public hearings. Relevant agencies commonly review the document and address remarks to the panel at public hearings. Typically, two or three months are allowed for the agencies and public to review and comment on the EIS.

When public hearings are completed, the panel writes an advisory report to the Minister of the Environment and other involved agencies. The panel's report is always made public. The initiator decides to what extent panel recommendations must be adopted before the proposal can proceed. These are incorporated into the design, construction, and operation of the proposal.

The initiator must see that decisions on suitable implementation, inspection, and monitoring programs are carried out. Interdepartmental committees, sometimes containing representatives from provinces or territories and the private sector, may be established to direct the implementation of the proposal (FEARO 1987).

Summary of Public Involvement in EARP: The public may have a limited opportunity to comment on a proposed project during its initial assessment. More formalized opportunities for public involvement, including public hearings, are provided for those projects that undergo a review by a panel. The panel incorporates public comment in its guidelines, and public meetings are held to discuss Environmental Impact Statements. FEARO publishes a quarterly "Register of Panel Projects." The Minister of the Environment notifies the press when panels are formed. If a proposal is not deemed significant enough to be reviewed by a panel, public notification and incorporation of

Figure 17:
Comparison of EARP and Proposed Assessment and Review Process



Federal Environmental
Assessment Review Office

Bureau federal d'examen
des evaluations environnementales

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4. Comparison of Current and Proposed Environmental Assessment and Review Processes

1. Comparison of Changes Arising from Proposed Legislation

Issue	Current	Proposed
Authority	Guidelines Order approved by Governor-in-Council	Canadian Environmental Assessment Act, binding on all federal Crown entities
Need for public review	Decision by minister responsible for project	Decision of Environment Minister
Application to regulatory agencies and Crown Corporations	Unclear or voluntary	Explicit requirements through regulation
Scope of assessment	No clear guidelines	Requirements to describe need for project and assess practical alternatives, cumulative effects and sustainability of resources
Public reviews	Panel review only option	Mediation and panel are options; panel review given subpoena powers
Duplicate hearings with other federal and provincial processes	Possible	Provisions to avoid duplicate hearings
Transborder effects	No federal role	Substantial federal role
Follow-up and monitoring	Not clearly required	Plans required as part of assessment proponent must implement
Administration	Federal Environmental Assessment Review Office, dependent on Environment Canada	Canadian Environmental Assessment Agency, independent of any other federal department or agency
Evaluation and reporting	No systematic process	Regular process of examination and reporting

Canada

Figure 17:

Comparison of EARP and Proposed Assessment and Review Process

2. Comparison of Changes Arising from Regulation, Orders and Guidelines

Issue	Current	Proposed
Exclusion list	Prepared by some departments without public consultation	One government-wide list prepared with public consultation
Class assessments	Not practiced	Practiced
Mandatory assessments	None required	List of projects requiring mandatory assessments
Procedures	None specified	Specified

3. Comparison of Changes Arising from Government Decision

Issue	Current	Proposed
Consideration of environmental matters in policy and program decisions before Cabinet	Uneven, discretionary	Environmental assessment to be included – statement to be published
Participant funding	Occasionally provided	Program established
Indian lands where no federal decision-making authority exists	Exempt	Land claims and self-government negotiators to address environmental assessment needs

September 1990

public comment are not required. New legislation should address the need for better public access to the process.

The proposed Canadian Environmental Assessment Act would greatly alter the current federal review process. Among other requirements, it would include provisions for assessing and mitigating transborder environmental effects, and would provide greater opportunity for public involvement at all stages of project assessment. A comparison of the present and proposed review process is shown in Figure 17.

Contact: Paul Scott, FEARO Western and Northern Region, (604) 666-2431.

Other Federal Environmental Reviews:

While the EARP process applies to most projects that undergo federal review, other review processes exist. The most major of these other review entities is the National Energy Board, which reviews major energy projects that have transboundary impacts. Certain types of energy projects require public hearings. These hearings are more formal and adjudicative then those in the EARP process. In some cases, FEARO and the Energy Board may be duplicative, but the new environmental assessment legislation should address this issue.

B. COORDINATED ENVIRONMENTAL REVIEW PROCESSES

Fraser River Estuary Management Program's (FREMP) Coordinated Project Review Process:

The Coordinated Project Review Process was developed under the Fraser River Estuary Management Program (Part VII, Estuary Management Programs) in 1986 to formally coordinate the review of all proposed projects by federal and provincial regulatory and management authorities in the estuary. All projects proposed in the Fraser River Estuary are referred to the "Central Project Registry" in the FREMP Secretariat Office. An Environmental Review Committee consisting of the key provincial and federal environmental agencies in the Fraser Estuary, coordinates agency comments, which are sent to the proponent through a designated lead agency (typically a Harbour Commission). Proposed projects are screened by the Committee, and depending on the significance of potential impacts, may be assessed through one of the three mechanisms: Interagency Referral, Task Force Review, or Formal Environmental Impact Assessment. Application and review procedures have been established for each level of review, including coordinating with other provincial and federal review processes.

FREMP Public Involvement: All project applications in the Central Project Registry (described above) are available for public review, and comments by the public on any particular project application are welcomed by the environmental review committee. To keep the public better informed regarding proposed projects, FREMP intends to have project applicants put notices in newspapers and plans to maintain a mailing list for updates on the Central Project Registry.

Contact: FREMP, (604) 525-1047.

Cowichan Estuary Project Review Process:

The Cowichan Estuary is located in southeastern Vancouver Island, north of Victoria. Proposed development activities in this estuary are generally subject to a single review procedure in which all regulatory agencies (federal, provincial, local) participate as appropriate. Proposals cannot proceed without approval from the designated lead agency responsible for administering the process. Provisions are made for environmental impact assessment administration scope and procedures, and the roles of various agencies and the public. Specifically, the review of development proposals within these management areas is designed to determine the environmental impacts of proposed development activities; to establish a level of conformity with area designation and objectives identified in the plan; and to evaluate the consequences of development relative to the land/resource base.

Contact: Sharon Daly, Environmental Assessment Branch, B.C. Environment, Lands and Parks (604) 387-9674

C. PROVINCIAL ENVIRONMENTAL REVIEW PROCESSES

In British Columbia, review and approval processes have been tailored to accommodate a broad range of development proposals, from simple applications for routine water withdrawals or waste discharge permits, to large, complex projects, such as mine or hydroelectric developments. There exist at least three mechanisms by which potential environmental impacts can be reviewed. These include the Government Referral System, Land/Resource Planning Processes, and Formal Integrated Project Review Processes.

Government Referral Processes:

The majority of small-scale, routine provincial, municipal, and private sector proposals are assessed through informal interagency referral processes (B.C. Env. 1990b). Interagency referral processes ensure that the program and policy concerns of various provincial agencies are considered in the review and approval of development applications and permits, and that final operations are environmentally sound and in the public interest. Separate review/approval processes are administered by various agencies to assess the following types of activities:

- navigable waters and small harbors (federal);
- foreshore development and mariculture proposals;
- waste discharge permitting
- allocation of harvesting rights for timber on Crown Lands;
- water licenses and permits;
- pesticide use permits;

- Crown Land disposition;
- mining road construction, petroleum exploration, and mineral exploration notices of work;
- oil and gas development proposals for geophysical programs, stream crossings, access routes, well sites, small petroleum facilities;
- environmental resource management plans; and
- local government official community plans (municipal).

Public Consultation during the Government Referral System: Public participation in the referral process is not legislated. The lead Ministry may inform the affected public of the proposal through regional offices or require the proponent to inform the public of the proposal (e.g. license for water use or diversion, under the Water Act). In many cases, public notice of the proposed development activity is printed in the local newspaper. In some cases, the proponent or the public may appeal a decision on a proposal to a more senior government official (e.g. Waste Management Permit Process), the responsible Minister (e.g. the Land Disposition Referral Procedure), or to the Environmental Appeal Board (Pesticide Use Permit Process).

2. Land/Resource Planning Processes:

2a. Regional Review Processes:

There are two regional review processes which are used to assess proposed projects within specified areas, namely the Fraser River Estuary and the Cowichan River Estuary. Under these review processes, all project proposals are screened for potential environmental impacts. Those projects which require extensive collection and analysis of project-related information are referred to one of the formal integrated EIA review processes. Public consultation is a component of the regional review processes. Both of these review processes are discussed in Section B, above.

2b. Area-Wide Planning Processes:

A number of provincial agencies administer area-wide planning processes to address more complex activities or development in sensitive areas which cannot be adequately handled by the normal government referral processes. As with the referral processes, lead agencies assure that government and public interests are incorporated in plan and program development, and there is usually a mechanism for public involvement. For example, the Ministry of Forests chairs a number of interagency planning processes (e.g. Timber Supply Area Plans, Five Year Resource Plans, and Integrated Watershed Management Plans) to ensure that the resource/land allocation needs and forest values of other agencies, organizations, and the public are considered. Other agencies, such as the Ministry of Environment, Lands and Parks have similar planning processes for establishing priorities and strategies.

3a. Integrated Project Review--Major Project Review Process:

This review process was introduced in 1990 as a non-legislated working policy of the Cabinet Committee on Sustainable Development (CCSD). The review process is administered and coordinated by a Major Project Steering Committee. The Ministries of Economic Development, Small Business and Trade, and Environment, Lands and Parks co-chair the Steering Committee. Other representatives to the Committee include the Ministry of Forestry, Ministry of Energy, Mines and Petroleum Resources, Ministry of Municipal Affairs, Recreation and Housing, Environment Canada, and FEARO. Representatives from the municipalities or regional district where the project would be located are also invited to join the Steering Committee for deliberations concerning the project (B.C. Env. 1991b).

The process provides for the comprehensive assessment of technical, socio-economic and environmental impacts of projects in four main categories: pulp and paper production, mineral smelting and refining, petrochemical, and ports and some marinas. Projects must receive approval-in-principle from the Project Steering Committee prior to permitting and construction. A number of diverse projects are being reviewed under the MPRP. One of the first projects to be reviewed under this process was the proposed expansion/modernization of the Celgar pulp mill at Castlegar.

The Major Project Review Process is divided into four steps, and is initiated when the proponent submits a Project Prospectus. For projects with no significant impacts as established by the Steering Committee, the Committee will grant approval-in-principle. If a project proceeds beyond the prospectus stage, the Steering Committee identifies a lead agency to chair an interagency working group. This working group designs project-specific "terms of reference" (i.e. the technical, social, and environmental issues should be addressed) upon which the proponent must base a Stage I report (B.C. Env. 1990b).

A Stage II report may be required for proponents that have not resolved the issues in their Stage I report. Once approval-in-principle is given, the proponent proceeds to Stage III to deal directly with government agencies for approvals, permits, and licenses (B.C. Env. 1990b).

Public Consultation during the Major Project Review Process: The Prospectus, Stage I and Stage II reports are available for public review and written comments. The public has 40 days to comment on a prospectus. Within two weeks of the prospectus release, the proponent must hold a public information meeting. In Stage I, the proponent must hold public information sessions to obtain additional feedback on the proposed project and potential impacts. At Stage II the CCSD may instruct the Steering Committee to provide for further public involvement by way of one of the following:

- appointment of an individual or a panel to conduct a fact-finding mission in order to verify and/or supplement existing information;
- appointment of a mediator/facilitator to meet separately with the affected parties to negotiate a mutually acceptable solution; or
- appointment of an individual or advisory panel to hold public hearings in order

to make recommendations to the CCSD.

Provincial Contact: David Parsons, Environmental Assessment Branch, B.C. Environment, Lands and Parks (604) 387-9677.

3b. Integrated Project Review--Provincial Energy Projects:

The Utilities Commission Act of 1980 authorizes the Ministry of Energy, Mines and Petroleum Resources (MEMPR) to regulate projects defined according to the amount of energy used or involved in transmission. The Energy Project Review Process (EPRP) is the review process under which regulated projects obtain certification. The Minister of Environment, Lands and Parks and the Minister of Energy, Mines, and Petroleum Resources jointly approve applications for energy project certificates (EPC's) and energy operation certificates. An Energy Project Coordinating Committee, consisting of representatives from the two Ministries, the British Columbia Utilities Commission and an advisory representative from FEARO, coordinates the EPC application process. The EPC application process provides a comprehensive review and evaluation of the environmental, social and economic impacts of the proposed projects. Legal requirements for the EPC application process are set out by regulation under the Utilities Commission Act.

Public Consultation during the Provincial Energy Project Review Process: A project proponent's application should contain a summary of information dissemination, public responses, major issues and concerns, and the potential resolution of such issues and concerns. The proponent is advised to initiate contact with the public and local interest groups, but this responsibility is not mandatory. A provision for a public hearing for all regulated energy projects exists, but is discretionary.

Contact: Denise Mullen, Energy Project Analysis Branch, Ministry of Energy, Mines and Petroleum Resources, (604) 356-2154.

3c. Integrated Project Review--Mine Development Assessment Process:

In August 1991, the Mine Development Assessment Act was proclaimed, establishing the Mine Development Assessment Process (MDAP). This process integrates environmental management with economic development by facilitating technically-sound and environmentally-acceptable coal and metal mining ventures in British Columbia. Objectives of the process include: providing a "one window" point of contact with government agencies regarding the information and regulatory requirements for specific projects; encouraging early identification of potential environmental and socio-economic issues; and ensuring consultation with the public and specific local governmental, aboriginal and non-governmental groups and interests.

The lead agency for the MDAP is the Ministry of Energy, Mines, and Petroleum Resources. A Management Committee, comprised of senior representatives of the ministries of Energy Mines and Petroleum Resources, and Environment, Lands and Parks, is responsible for administering the Act. The Mine Development Assessment

Branch, Ministry of Energy, Mines and Petroleum Resources, coordinates the overall review of proposed mine developments.

To facilitate the preparation and review of an application, proponents are expected to submit a prospectus. This document contains a brief description of the project and potential environmental and socio-economic impacts, and proposed consultation program. During the review of the prospectus, information gaps are identified before mine proponents submit a formal application.

Applications contain a detailed plan of the proposed mine development as well as a detailed assessment of the environmental and socio-economic impacts, and impact mitigation or management proposals. Upon completion, the Management Committee makes recommendations to the Ministers of Energy, Mines, and Petroleum Resources, and Environment, Lands and Parks, regarding the disposition of the application.

Public Consultation During the Mine Development Assessment Process: Opportunities for input from local governments, aboriginal groups and the public are provided at all stages of the MDAP. Consultation is required before an application is accepted for disposition, during the review and disposition of an application. Public involvement programs are developed on a project-by-project basis.

Contact: Anne Currie, Ministry of Energy, Mines and Petroleum Resources, (604) 356-2195.

D. U.S. FEDERAL ENVIRONMENTAL REVIEW PROCESSES

The National Environmental Policy Act (NEPA) provides for the most comprehensive environmental review at the federal review, although federal activities may undergo review at the state and local level, or may be subject to more minor types of federal review.

The National Environmental Policy Act (NEPA):

The National Environmental Policy Act, signed in 1970, created the Environmental Impact Statement (EIS) process, which requires every federal agency to prepare a detailed statement on any major action it proposes that would significantly affect the environment--whether it involves funding a local highway project, licensing a new powerplant, or constructing a federal building (Orloff 1978).

The process involves four major stages:

Stage 1. The federal agency performs an environmental assessment to determine whether an EIS must be prepared for the proposed action. The law requires an EIS whenever an agency proposes to take an action that "significantly affects" the environment. Each agency has guidelines specific to its activities.

Stage 2. If an EIS is required, the agency prepares a draft statement--a preliminary report on the environmental consequences of the project. At this time, the agency identifies alternatives, including those which may be more environmentally preferable. If a statement is not required, the agency will proceed with its action, concluding its environmental review with a "Finding of No Significant Impact."

Stage 3. The agency sends the draft EIS to all groups and individuals having an interest in the proposed action, including governments, businesses, and interest groups. These parties usually have about 45 days to send comments on the draft to the agency. The agency prepares a final EIS by revising the draft to incorporate the agency's response to the comments.

Stage 4. The agency proceeds to make a decision on the project, based on the analysis contained in the EIS as well as non-environmental factors (Orloff 1978). The agency must explain why the alternative was chosen in its Record of Decision, which concludes the environmental review process.

Summary of Public Involvement in the NEPA process: Citizen comments are addressed in an agency's final impact statement. Although a federal department is not required to choose the most environmentally preferable alternative, the EIS process ensures that the alternatives will be considered and that the public will be allowed to comment upon the identified choices available. Federal Contact: Jerry Opatz, Environmental Review Section, U.S. Environmental Protection Agency, (206) 553-8505.

Other Federal Review Processes:

Although NEPA is the most comprehensive and major of the U.S. federal environmental review processes, others exist. For example, the Army Corps of Engineers 404 permits (for the discharge of dredge and fill material) are reviewed by the Corps, EPA, and other agencies. The Federal Energy Regulatory Commission (FERC) reviews license applications for many non-federal hydroelectric projects. Various review processes for hazardous substance storage and disposal also exist under the Superfund Amendments and Reauthorization Act (SARA), and the Resource Conservation and Recovery Act (RCRA).

E. WASHINGTON STATE ENVIRONMENTAL REVIEW PROCESSES

While many types of review processes occur at the state and the local level, the following discussion summarizes the most well-known and commonly used processes.

State Environmental Policy Act:

Modeled after the National Environmental Policy Act, the State Environmental Policy Act (SEPA) requires all state and local government agencies to review the environmental effects of all governmental actions and all projects that require state or local permits. Some actions and projects (like NPDES permits) are categorically exempt, as determined by SEPA rules established by special councils set up by the legislature to design certain aspects of the process.

City and county governments typically serve as the lead agency in the SEPA review process. However, for thirteen categories of major projects, the SEPA rules require specific state agencies (typically Ecology or the Department of Natural Resources) to take the lead.

Environmental review entails the use of a fifteen page environmental checklist filled out by the applicant and submitted to the lead agency. Following submission, the lead agency issues a determination of significance or non-significance. If a determination of non-significance is issued, the project may go forward as planned, unless it falls under one of four categories:

1. Another agency also has jurisdiction over the proposal.
2. The lead agency identifies mitigative actions which will make the project acceptable.
3. The proposal is a certain type of demolition project.
4. The proposal is a certain type of grade and fill project.

If the proposed project meets one of the above criteria, a fifteen day comment period is required on the determination. The lead agency sends the environmental checklist and determination of non-significance to Ecology and interested parties, and gives public notice. Following comment, the lead agency may decide to change its determination.

If a project is deemed significant, the "scoping process" occurs. This process entails an announcement (made by the lead agency) which states that an Environmental Impact Statement will be written and asks for comment on what issues need to be included. Affected and interested parties and agencies have 21 days to respond to the announcement.

Once through the scoping process, the lead agency writes a draft EIS. When the draft EIS is completed, the agency issues a public notice and sends copies of the draft to all interested parties. A 30 day comment period follows.
Fifteen days after the release of the draft, the lead agency can choose to have a public hearing, but SEPA does not require hearings.

The final environmental impact statement responds to the comments received by the lead agency. SEPA does not require that public notice be given on the final EIS, but it must be sent to all parties and agencies that received a copy of the draft and/or commented on the draft. The agency has seven days to consider the EIS. In order to deny a project, an agency must find that the proposal would result in significant adverse impacts that were identified in the project EIS and that cannot be mitigated with reasonable control measures (PSWQA 1986b).

Throughout the environmental review process, the lead agency's conditions and denials must be based upon policies incorporated into the regulations, plans, or codes that the agency formally designated as possible bases for decisions pursuant to SEPA (PSWQA 1986b).

Summary of Public Involvement in the SEPA process: The public has fifteen days to comment on some projects that are deemed non-significant. During the scoping process, interested parties have twenty-one days to make recommendations regarding issues that should be addressed in the draft EIS. Once the lead agency releases the draft EIS, the public has thirty days to comment. In the final environmental impact statement, the lead agency must respond to comments made by the public on the draft. These comments may be written or gathered through public hearings.

Contact: Barbara Ritchie, Department of Ecology, Central Programs and Enforcement, (206) 459-6025.

Shoreline Management Act:

Under the Shoreline Management Act, shoreline permits are required for certain activities that occur within 200 feet of the ordinary high-water mark of streams and rivers with average flows greater than 20 cubic feet per second, lakes greater than 20 acres, Puget Sound, and wetlands associated with the shorelines of the above waters. All shoreline substantial development permits (for projects over $1000 in cost) and exemptions to the permit process are reviewed by Ecology. The public must be notified of all permit applications or exemptions, and public comment must be considered in decisions regarding the issuance of permits. A permit appeal process exists for citizens, citizen groups, and or government agencies. These appeals are heard by the Shorelines Hearings Board, a six-member quasi-judicial body appointed by the Governor (PSWQA 1990c).

Energy Facility Site Evaluation Council:

This independent agency was first formed in 1970 and is comprised of thirteen representatives of state agencies and one citizen chair appointed by the Governor. Currently three staff members support the council, and work out of the Washington State Energy Office. The Council serves as a coordinated environmental review process for major energy facilities such as thermal power plants above 250 megawatts, major oil and natural gas pipelines within the state, natural gas storage fields, and some types of oil refinery expansions or new facilities. The Council typically contracts with a consultant, state agency, or combination of the two to perform the review.

As soon as the application is received, the Council begins drafting an environmental impact statement. The first stages of the review process entail the determination of whether the proposed project is in compliance with local land-use and zoning plans. Within sixty days of the Council's receipt of the project application, the contractors schedule land-use hearings and hearings for public comment in the areas to be impacted by the project. After a project is deemed to be in compliance with local land-use, a formal, adjudicative hearing takes place in which expert witnesses testify as to the technical, economic, social, or environmental significance of the project. Usually the hearings process is completed within a year. Before the hearings begin, if the proponent chooses, it can ask the Council to conduct a preliminary site study to identify what issues will need to be addressed during the hearings process (the Transmountain Low Point Project, a proposed crude oil pipeline and facilities that would run under parts of Puget Sound from west of Port Angeles to Ferndale and Anacortes, is in this stage of the review process).

Based upon the results of the hearing and other information received, the Council issues a final EIS. After the release of this EIS, the members of the Council collectively decide whether to approve or disapprove of the project, and recommend to the Governor that a license should or should not be issued. The Governor can accept or reject the Council's recommendation, or can send it back to the Council for further deliberation. In the past, the Governor has always accepted the Council's recommendations.

Once a license has been issued, that license takes the place of all other state permits and licenses, including Shoreline permits and NPDES permits. The Council is responsible for monitoring and enforcing the permit holders' compliance with the environmental requirements in the site certificate agreements.

Summary of Public Involvement in the Energy Facility Siting process: The state's citizens have a chance to comment during the (optional) preliminary site study, at the local land-use and public hearings, and can comment on the draft EIS once it has been released. Comments are considered in the Council's final EIS.

Contact: Jason Zellar, Energy Facility Site Evaluation Council, (206) 956-2047.

Other State Environmental Review Processes:

In addition to the review processes mentioned above, many other permit and license applicants must undergo project review and public comment in order take certain actions. National Point Discharge Elimination System (NPDES) permits are subject to public review, as are the new air regulation permits, water rights permits, and many projects reviewed at the local level. Floodplain development projects are reviewed by local governments and may require a public hearing, as do zoning code variances, some building permits, and some subdivision approvals (Ecology 1990a).

PART X. TOWARD CONTINUED TRANSBOUNDARY COOPERATION

Despite the differences between systems of government, administrative structure, and environmental ideologies, the United States and Canada, and Washington and British Columbia, have a history of cooperation and communication on issues of a transboundary nature. Treaties and agreements signed by parties on both sides of the border range from long-standing arrangements such as the Boundary Waters Treaty to the recently signed Air Quality Agreement. At the regional level, formal cooperation has resulted in the Canadian and U.S. Coast Guard's management of transportation routes in shared inland waters as well as the recently formed Oil Spill Task Force. Other informal arrangements for addressing transboundary pollution have been designed as the need has arisen. Some of these formal and informal means of cooperation are discussed in the following section, and may serve as a basis for future cooperative efforts.

A. INTERNATIONAL TREATIES

The Boundary Waters Treaty/The International Joint Commission:

The Boundary Waters Treaty of 1909 established the International Joint Commission (constituted in 1911). The Treaty establishes that each country has equal and similar rights in the use of boundary waters. It also maintains that "waters flowing across the boundary shall not be polluted on either side to the injury of health or property of the other." The Commission serves as the permanent administrative body for preventing and solving water apportionment and quality disputes between the U.S. and Canada (Sadler 1987).

The Commission is composed of six members, three from each country, and is supported by a Secretariat in Ottawa and D.C. Most of the specialized work of the IJC is undertaken through appointed boards of qualified experts from state, provincial, and federal governments, and occasionally from nongovernmental organizations (Sadler 1987).

The IJC becomes involved in a boundary waters dispute when the dispute affects national sovereignty and the two federal governments are not able to negotiate an agreement. The process is activated when the U.S. State Department and Canadian Department of External Affairs contact their respective secretariats.

The Commission performs three major functions:

1. It operates as a quasi-judicial body for approving and regulating projects or developments that affect boundary waters.

2. It conducts investigations and prepares reports on water issues and other matters referred by the two nations.

3. Has a mandate to act as an arbitrator of specific disputes (Sadler 1987).

During the past 80 years, the IJC has functioned primarily in an approval and regulatory capacity, but over the last twenty years its investigative activities have increased (Sadler 1987). The IJC has been most active solving disputes over the Great Lakes, however in the Pacific Northwest it has worked toward settling controversies over the Skagit-Ross Dam and developing the Columbia River Treaty (which addressed power, flood control, and irrigation). Although the IJC may seem an obvious alternative for peacefully resolving international disputes, the process is lengthy and is preferred by most parties for those instances of international significance when informal negotiations or solutions are unlikely.

Canada/U.S. Air Quality Agreement:

The recently signed Air Quality Agreement seeks to control transboundary air pollution between the two countries and spells out emissions limitations for sulphur dioxide and nitrogen oxides (precursors to acid rain). The agreement calls for the establishment of objectives for emissions limitations or reductions of other air pollutants, and requires that environmental impact assessments and mitigative actions be undertaken for new industrial projects that potentially affect the other side of the border. Both the U.S. and Canada agree to carry out coordinated or cooperative scientific and technical activities and economic research, and to establish the necessary institutional arrangements. The agreement was signed by the nations' two leaders in March 1991, and is slightly less binding than a formal treaty.

Migratory Birds Convention:

Because "many species of birds in the course of their annual migrations traverse certain parts of the Dominion of Canada and the United States," this convention between the U.S. and Canada serves to protect migratory birds in the two countries. Both federal governments are given jurisdiction over regulations in their respective countries regarding hunting, taking, shipping, and exporting migratory bird species, and may permanently protect habitat lands or waters for the purposes of this convention. Under this treaty, the North American Waterfowl Management Plan was developed, one element of which is the recently designed Pacific Coast Joint Venture. This Joint Venture is a cooperative agreement between government agents in British Columbia, Washington, Oregon, and California to protect and save wetlands significant to migratory birds.

U.S./Canada Pacific Salmon Treaty, 1985:

This treaty provides a forum for Washington, British Columbia, Idaho, Oregon, twenty-four Indian Tribes, the U.S. Departments of Commerce, Interior, and State, Environment Canada, Fisheries and Oceans Canada, and External Affairs Canada, to develop international quotas for salmon species caught in interception salmon fisheries.

A bilateral Commission finalizes negotiated annual fishery regimes, allocating fisheries quota to each nation (NPC 1990).

B. STATE/PROVINCIAL ARRANGEMENTS

States/B.C. Oil Spill Memorandum of Agreement and Task Force:

In recognition that the "Province and the States share and manage transboundary fish and wildlife in and near the waters of the Pacific Ocean," and in concurrence that "such fish and wildlife and the supporting environment must be given fullest protection from damage caused by spills and other discharges of oil," British Columbia and Washington, Alaska, Oregon, and California signed the Oil Spill Memorandum of Agreement in 1989. Under this agreement, the Oil Spill Task Force was formed to develop coordinated programs for oil pollution prevention, abatement, and response. The Task Force is chaired jointly by the British Columbia Deputy Minister of Environment and the Directors/Commissioners of the states' chief environmental agencies. Representatives of each agency are appointed to maintain the agreement and meet annually to review progress and plan future cooperation.

Four subcommittees address prevention alternatives, technology sharing, emergency response, and financial recovery. Specific issues discussed include:

- creation of a joint emergency response plan;
- evaluation of capabilities and technologies for spill prevention;
- review of tanker safety, routes and operating requirements;
- inventory of equipment, material, and personnel available to either the Province or the States for use in oil spill control and clean-up operations; and
- joint spill response drills and training (Memorandum 1989).

Each party bears its own expenses of cooperating, and no separate legal or administrative entity is formed by the Memorandum.

B.C./Washington Memorandum of Understanding on the Environment:

Washington's Department of Ecology and British Columbia's Ministry of Environment, Lands and Parks have begun discussions on a memorandum of cooperation between the Province and the State on environmental matters. This agreement would be along the same lines as existing agreements concerned with trade, investment, and tourism, and would provide for enhanced communication and cooperation between the two jurisdictions on transboundary environmental matters.

Contacts: Carol Jolly, Department of Ecology (206) 493-9111; Jamie Alley, B.C. Environment, Lands and Parks, (604) 387-9670.

The Pacific Northwest Economic Region:

This group of about 60 legislators from Alaska, Alberta, British Columbia, Idaho, Montana, Oregon, and Washington formed in 1989 to explore pooling resources and cooperating on economic matters as well as education, research and development, energy and natural resources. Staffed by the Northwest Policy Center at the University of Washington, the group has discussed compacts on topics such as creating markets for recycled products and environmental protection. It is one avenue for legislators from around the region to exchange ideas and promote interstate and international cooperation (Claiborne 1991).

Contact: The Northwest Policy Center (206) 543-7900.

Nooksack River Task Force:

This task force was convened after the 1990 flooding of the Nooksack River into Canada near Abbotsford, B.C. Representatives of Whatcom County (Washington), the U.S. Army Corps of Engineers, Washington's Departments of Ecology and Health, B.C. Environment, Lands and Parks, and Environment Canada have met to discuss possible solutions to the flooding problem. A report on the Task Force's findings is expected in early 1992.

Contacts: Ron Henry, B.C. Environment, Lands and Parks, (604) 852-5404; Jerry Louthain, Washington Department of Ecology (206) 459-6791.

Lynden-Everson-Nooksack-Sumas (LENS) Groundwater Study:

Spearheaded by Whatcom County's planning department, with funding assistance from the Department of Ecology, the U.S. Geological Survey is studying the groundwater from which these four incorporated areas (Lynden, Everson, Nooksack, Sumas) draw their drinking supplies, and is seeking to identify the sources of the groundwater's nitrate pollution. Because the aquifer extends into British Columbia, the study participants anticipate working closely with Canadian and provincial environmental, agricultural, and health officials to survey the province's portion of the aquifer and collect information. The study is expected to be completed by July of 1992, at which time possible transboundary management issues will be discussed.

Contact: Craig Mapel, Whatcom County Planning (206) 398-1310.

The Lake Roosevelt Water Quality Council:

This Council recently formed to plan and manage a federally funded program designed to protect water quality and clean up dioxins and other pollutants that have settled in the lake behind the Grand Coulee Dam. The Council consists of representatives of local citizen groups and state, tribal, and federal government agencies. Representatives from Environment Canada and B.C. Environment, Lands and Parks have also been invited to participate in the planning and management process.

Contact: Judith Leckrone, U.S. Environmental Protection Agency, (206) 553-6911.

C. COOPERATION ALONG OTHER PARTS OF THE INTERNATIONAL BORDER

While the states, provinces, and federal governments are working to solve transboundary environmental disputes at many points along the border, the following two examples seem relevant to any potential cooperative agreement regarding the management of the Puget Sound/Georgia Strait body of water.

Great Lakes Water Quality Agreements of 1972 and 1978:

The purpose of the agreements is to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem. In order to achieve this purpose, the U.S. and Canada will make a maximum effort to develop programs, practices, and technology necessary for a better understanding of the Great Lakes Basin Ecosystem and to eliminate or reduce to the maximum extent practicable the discharge of pollutants into the Great Lakes System.

Contact: Great Lakes National Program Office, (312) 353-3503.

The Gulf of Maine Council on the Marine Environment:

This council was established by the governors of Maine, Massachusetts and New Hampshire, and the Premiers of Nova Scotia and New Brunswick to improve the environmental management of the Gulf of Maine. The Council's working group, (consisting of representatives from federal, state, and provincial agencies) and Secretariat produced an Action Plan in July 1991. The plan included provisions for coordinated monitoring and research between the states and provinces, public participation and education, and improved management of coastal and marine resources.

Contact: John Catena, Maine State Planning, (207) 289-3261.

PART XI. RECOMMENDATIONS AND CONCLUSION

This report has outlined the structure of governments in British Columbia and Washington, and has discussed the environmental policies, regulations, and programs most relevant to managing surface water quality on both sides of the border. By also summarizing monitoring efforts, environmental review processes, modes of public participation, and existing means of cooperation, this report has provided the reader with the basic background to understand and work toward resolving transboundary environmental issues. To augment those cooperative arrangements that currently exist, and effectively progress toward responsible management of a shared environment, several recommended approaches should be explored by regulators and citizens concerned with transboundary issues.

1. The first of these approaches encourages **enhanced and regular communication between regulatory officials, decision makers, and citizens groups in British Columbia and Washington State.** Meetings or conference calls between upper-level government administrators should occur at regular intervals to keep one another informed about issues of concern, including future regulatory actions and potential political changes. Other decision makers and regulators involved with potential transboundary issues should also make contact with their counterparts in the other nation, to promote cooperative and efficient government actions. Citizens groups should continue efforts to work together to help develop and monitor policies that affect both sides of the border. Efforts toward achieving better communication have begun, and should proceed on a regular basis, both in order to share knowledge and to avoid conflict between the two separate jurisdictions.

2. Efforts should be made to **collect and share relevant monitoring and scientific information with technical counterparts** in the other nation, and a process for information exchange should be developed. This could be achieved through international conferences, sharing of published materials, and/or regular, informal contact between federal, provincial and state public officials. To make technical information relevant to both sides, the potential for standardized protocols for sampling and analysis could also be explored. With shared environmental data, mutual decisions could be made regarding whether a transboundary pollution problem exists.

3. A third recommendation involves the concept of **similarly protective environmental policies for shared natural resources.** Through the years, several suggestions have been made concerning international treaties or agreements for the shared waters of the Pacific Northwest. One such suggestion is to declare the Straits of Juan de Fuca and Georgia to be an inland sea, and develop an international treaty similar to that of the Great Lakes. Another approach, put forth by the Puget Sound Water Quality Authority, is to develop an international water quality management plan for Puget Sound and the Strait of Georgia, which would comprehensively address pollution issues on both sides of the border (PSWQA 1987). A third proposal involves the negotiation of a system of site-specific water quality standards or guidelines for transboundary waters, with shared monitoring responsibilities (Carroll 1979). These ideas should be examined further, as

similar environmental policies could lead to pooled technical and financial resources, enhanced environmental protection, and the avoidance of potentially costly conflict.

4. The fourth and final approach to responsibly managing transboundary resources is to **continue to cooperate on management decisions.** The current effort to produce an environmental protection agreement between Washington and British Columbia (see Part X, Section B) should continue, as this agreement could provide a formal means of promoting cooperation and communication. Such an agreement could also legitimize inquiry into prospective problems before they become controversial. Citizen groups and government organizations should proceed with efforts to form international task forces and committees to address transboundary issues. The work of the States/B.C. Oil Spill Task Force should especially be maintained, as it provides the region with an example of how the states and provinces can successfully work together to address environmental concerns.

In order to successfully address the issue of transboundary pollution, agencies in both nations must recognize it as significant and assign staff time to resolving the conflicts that arise. The political traditions of the different governments must be understood and respected by citizens and regulators on both sides. The natural environment of the Northwest is a resource shared by the residents of the region as well as its visitors, and is an environment worthy of international protection. While this report has focused on the quality of water, other resources such as the atmosphere, the land, and the living creatures of the region also depend upon international cooperation for protection.

As the Pacific Northwest continues to grow both economically and in population, transboundary environmental issues and pollution will become more critical. Additional pressures on the region's treasured natural resources will continue to draw attention to the problems and the public will continue to call for solutions. Whether due to vehicle traffic, oil pollution, sewage discharge, industrial waste, or hazardous materials production, issues affecting both sides of the border will need to be addressed at an international level. To effectively protect and enhance the region's environment and prevent misunderstanding, the federal, state, and provincial governments must work together to solve common problems. The contents of this report should provide a background for enhanced cooperative efforts in resource protection, but it is the responsibility of the region's citizens and public officials to move forward in that direction.

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